ANOTHER WAR PRODUCTION NUMBER

Coal Age

JUNE 1942

McGRAW-HILL PUBLISHING COMPANY, INC. • THIRTY-FIVE CENTS PER COPY

"MOGENTOR"
Monitors at New Poinsettia Mine

•

FOREMEN'S FORUM
Tells How to Maintain Belting

•

WELDING A "MUST"
For Low Maintenance Operations

•

STOKER FUEL MADE
At University Experimental Plant

•

TRUCKING AGENCY
Washes and Oil-Treats Coal

•

NEW AIRSHAFT
Sunk by Mechanized Methods

•

COAL'S NEWS
With Some Editorial Slants

•

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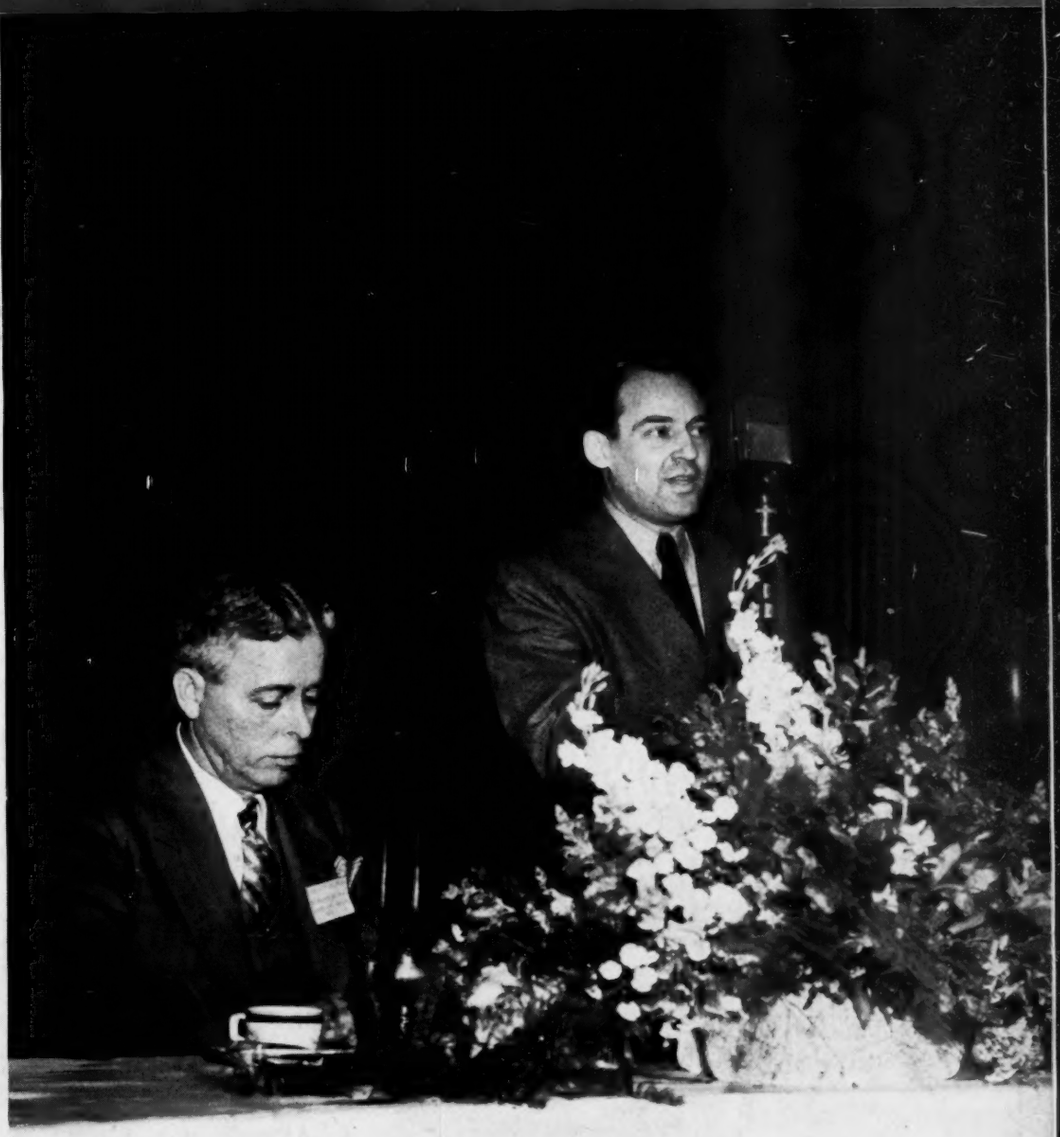


Wilbur Nelson Listens as John Haddock Talks at Cincinnati A.M.C. Luncheon Meeting

Carbon Conquered . . . Air Power Maintained

SUN MINE LUBRICANTS

Stopped Valves Sticking . . Made Air Compressors Behave

A large mining concern was having trouble with air compressor operation. Varnish-like, sticky carbon gummed up valves, made them stick . . . air pressures were irregular . . . shut-downs for cleaning meant lost production time. A switch was made to a SUN Air Compressor Oil. Sticking valves stopped . . . air power was maintained.

That's a report of another mine lubrication problem solved by a Sun Oil Engineer—one of those Doctors of Industry. Another example of how Sun Engineering Service and Sun Mine Lubricants are helping mine operators obtain "all out" production of fuel for America's war effort.

Whether your problem be the lubrication of mine car wheels, mining machines, main power equipment or tipple machinery—Sun's Doctors of Industry stand ready, willing and able to help you. Their services are yours to use to help step up production . . . the products they have to offer are designed to help maintain that production. For proof of what they have accomplished, send for your free copy of "Helping Industry Help America." Write SUN OIL COMPANY, Philadelphia. In Canada: Sun Oil Co., Ltd., Toronto.

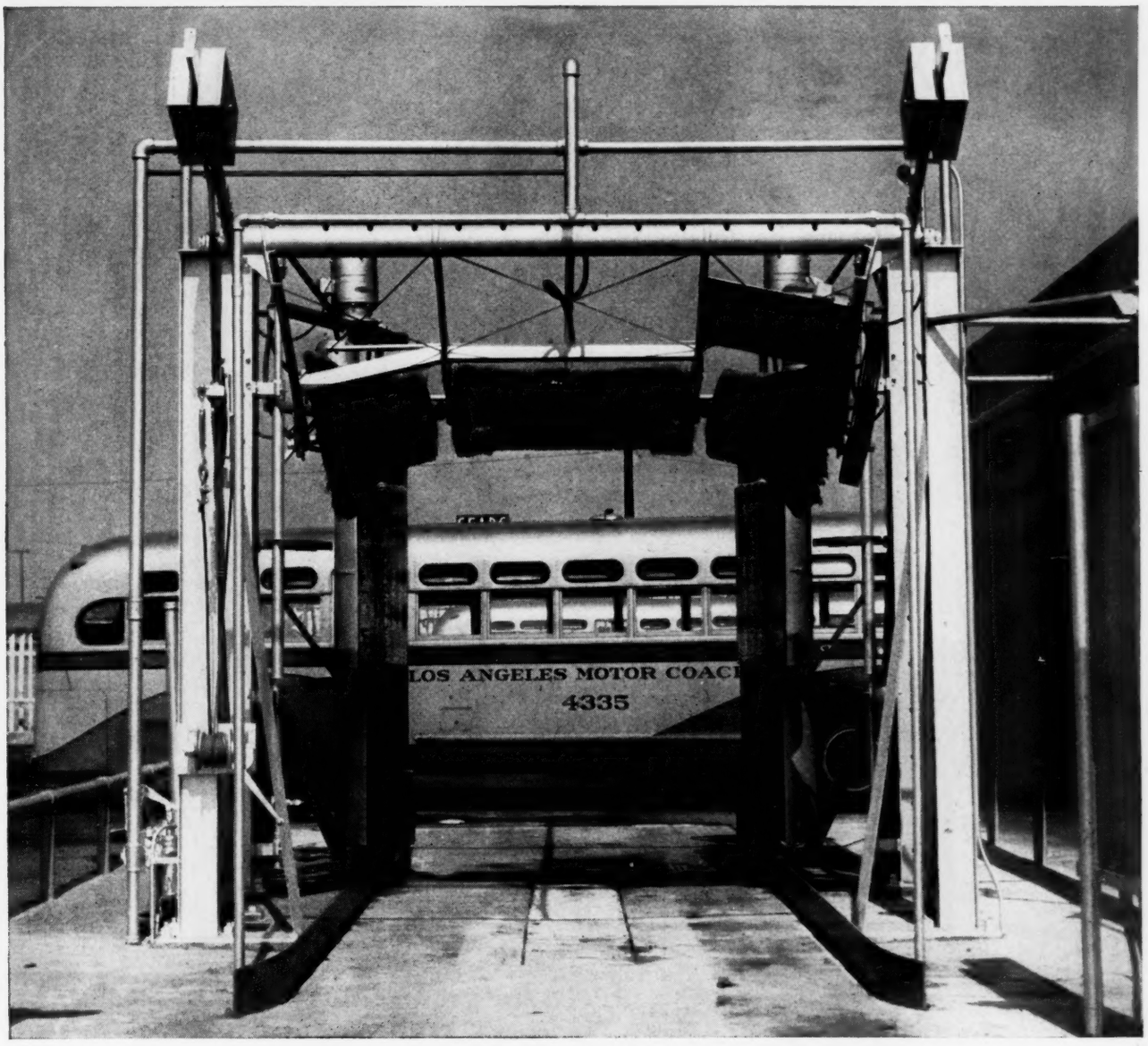
"LET'S GO! U.S.A." "KEEP 'EM FLYING!"

SUN MINE LUBRICANTS
include:
SUN Pressure Grease
SUN Compressor Oils
SUN Journal Oils
SUN Mine Car Lubricants
SUN Ball & Roller Bearing Greases

SUNOCO

SUN PETROLEUM PRODUCTS

HELPING INDUSTRY HELP AMERI



The machine that gives busses the brush-off

A typical example of B. F. Goodrich development in rubber

IF WASHING a car is a chore, what would you think about a mud-spattered bus? And bus companies like to keep their busses shining clean all the time.

Engineers of one big company worked out a machine that shoots streams of water around 10-foot revolving brushes, and these brushes scrub the sides and top all at the same time — while the bus is being driven slowly under and between them. They believed the machine would be practical for general use if it could be kept simple in operation, and the simplest way to drive these whirling brushes was with V belts. But the engineers knew bright sunlight is hard on rubber and that fabric in these belts sometimes absorbs moisture and loses its strength. Had V belts been improved enough to stand up for months and years in outdoor service?

B. F. Goodrich could assure them they had. In fact, Goodrich V belts had been improved more than a dozen times in five years. They now have improved resistance to heat, dust, sunlight, and to wear caused by flexing, and they have a type of covering that acts as a "raincoat" to keep moisture away from the inner cords. So they were installed on the bus-washing machines and are now giving long and satisfactory service.

Even during the period of rubber restrictions B. F. Goodrich development work goes on and future improvements in all kinds of products will be planned and ready for industry when the war is over. *The B. F. Goodrich Company, Industrial Products Division, Akron, Ohio.*

B.F. Goodrich

FIRST IN RUBBER

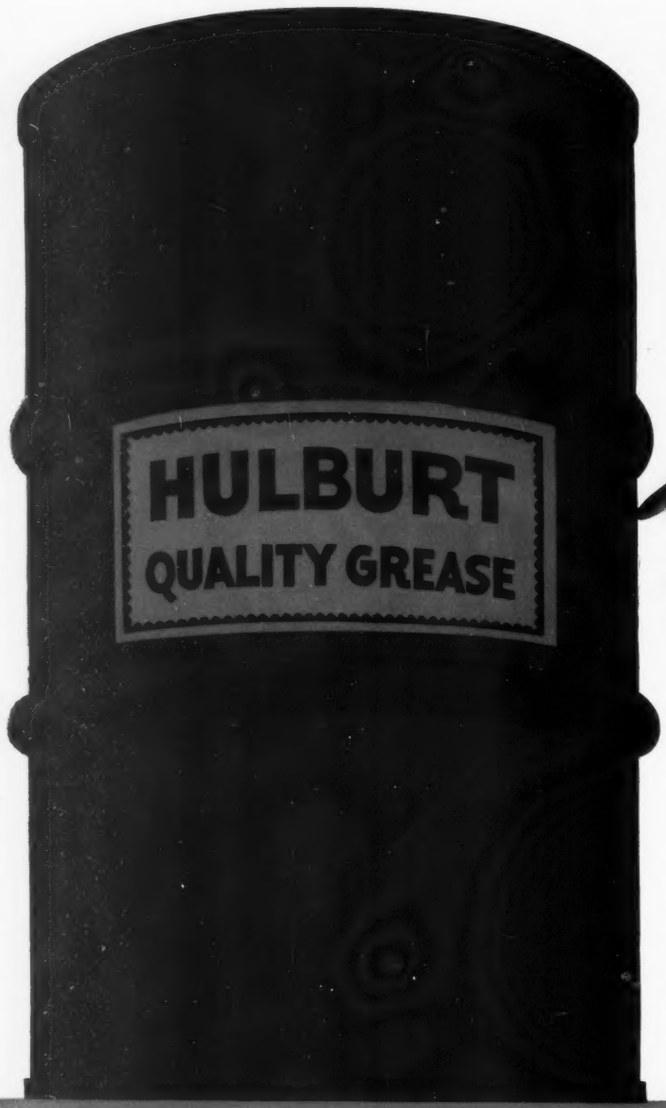
STAMP HIM OUT WITH H

The friction devil is an enemy that must be stamped out! He's one of Uncle Sam's most subtle and formidable foes. Hulburt Lubrication Specialists know how to chase him out of Coal Mine Equipment with Hulburt Quality Grease—the only grease made exclusively for coal mine equipment. Call in a Hulburt Specialist for your down-in-the-mine survey.

HULBURT OIL & GREASE COMPANY

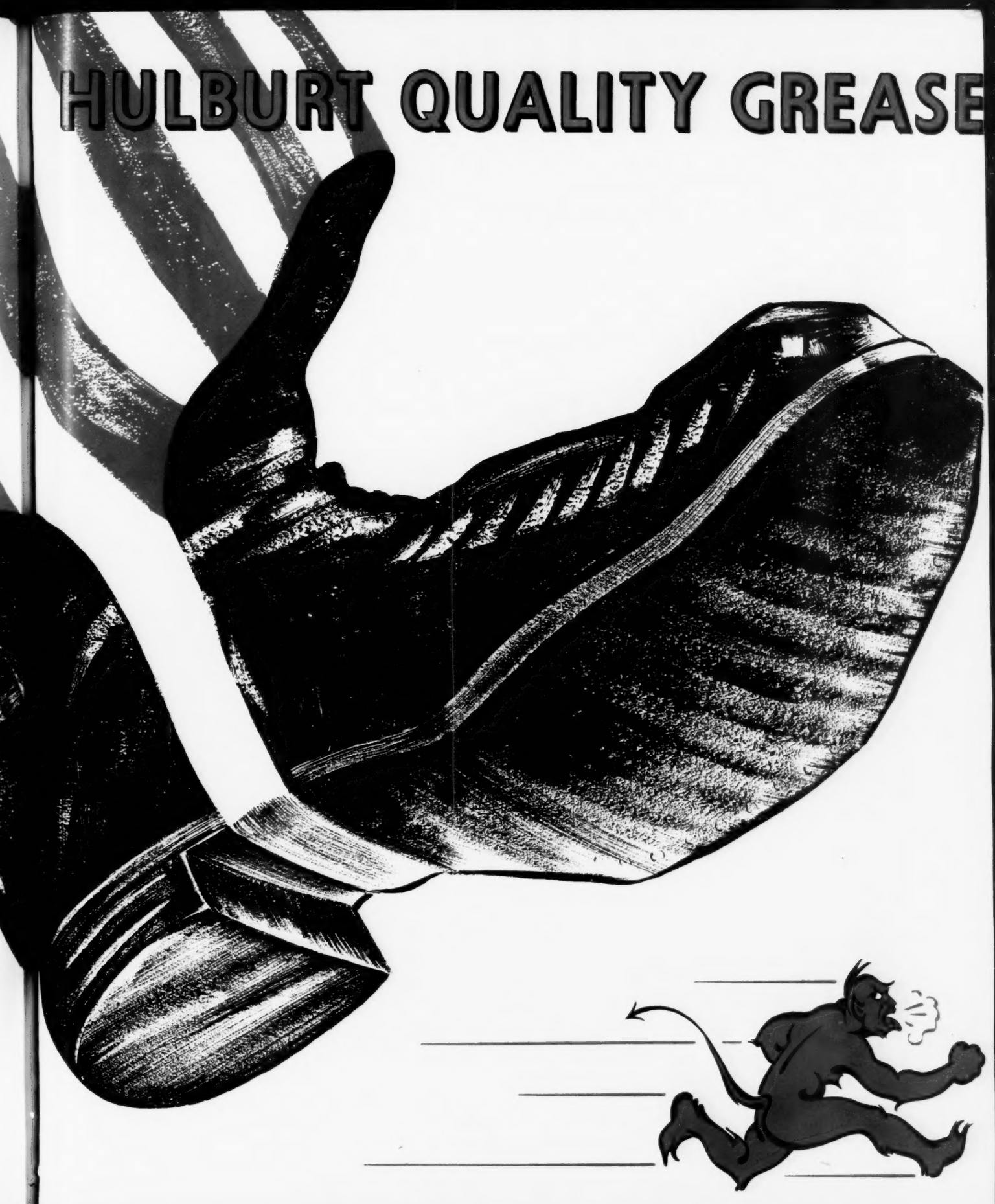
Specialists in Coal Mine Lubrication

PHILADELPHIA . . . PENNSYLVANIA



HULBURT

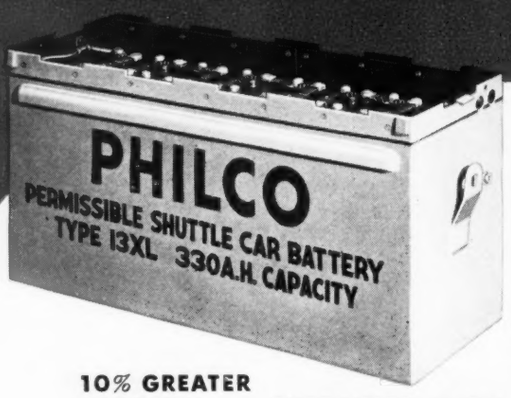
HULBURT QUALITY GREASE



QUALITY GREASE

Haul 10% More Coal Between Charges—

WITH POWERFUL PHILCO XL STORAGE BATTERIES!



10% GREATER CAPACITY . . . SUSTAINED HIGH VOLTAGE...LONG PRODUCTIVE LIFE

- Philco oversize grid and Philco engineering developments give you a positive 10% greater capacity.
- Philco rugged Construction keeps maintenance costs at a minimum.
- Philco "K" Process produces a flint-hard plate of exceptional porosity with superior bond between material and grid.
- Philco Triple Insulation adds months of dependable service by "sealing" the active material into the grid with Glass Fibre Mats . . . Slotted Rubber Retainers . . . rugged Separators.

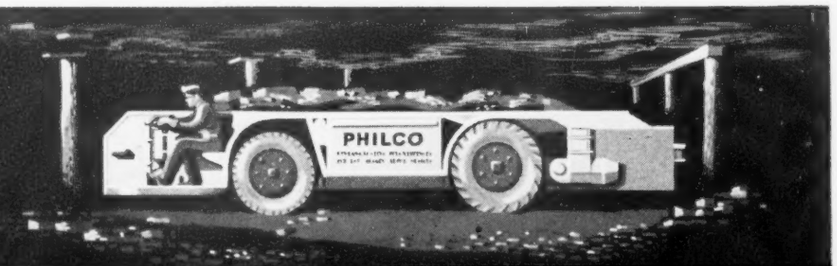
With Philco XL Storage Batteries in your Joy Shuttle Cars or mine locomotives you can keep going 10% longer between charges! Philco gives you 10% greater capacity . . . with sustained high voltage, hour after hour!

Philco's 50 years of practical experience and intensive development work bring you a battery with reserve power . . . long productive life . . . extra wallop for long hours of service . . . minimum maintenance costs!

And because our production facilities have been *tripled* you can now get Philco batteries in half the time that is current practice in the industry! Specify Philco!

Just out! New catalog of Philco Shuttle Car and Mine Locomotive Batteries. Write for your copy today. Philco Storage Battery Division, Dept. C, Trenton, N. J.

PHILCO STORAGE BATTERIES—DEPENDABLE MOTIVE POWER FOR JOY SHUTTLE CARS AND MINE LOCOMOTIVES.



PHILCO Storage Batteries

PHILCO'S NEW TRENTON, N. J. PLANT HAS TRIPLED PRODUCTION FACILITIES OF PHILCO STORAGE BATTERIES

FIFTIETH ANNIVERSARY
PHILCO
1892 1942

JUNE 1942 Thirty-Five Cents Per Copy

Coal Age

Devoted to the Operating, Technical and Business Problems of the Coal-Mining Industry

Volume 47 No. 6

To the front with the news, p. 47. Frankly an experiment, Coal Age with this issue attempts to segregate and present in its first sixteen editorial pages the more important industry news of the month. Furthermore, where particular significance is attached to specific news items, editorial comment or interpretation may be found appended. Where war in all its aspects speeds up the nation's effort, Coal Age, by the above procedure, condenses the most important items for its now-hurried readers. . . . **More news** from the field, in both national and regional detail, will be found in the back of the book. . . . **Equipment tips** from manufacturers also makes its sectional bow in this number. Replacing the New Equipment pages formerly made up in four-column measure—now changed to three—June Coal Age carries the description and sometimes a photograph of machinery and supplies originally scheduled for exhibits at the W.P.B.-cancelled

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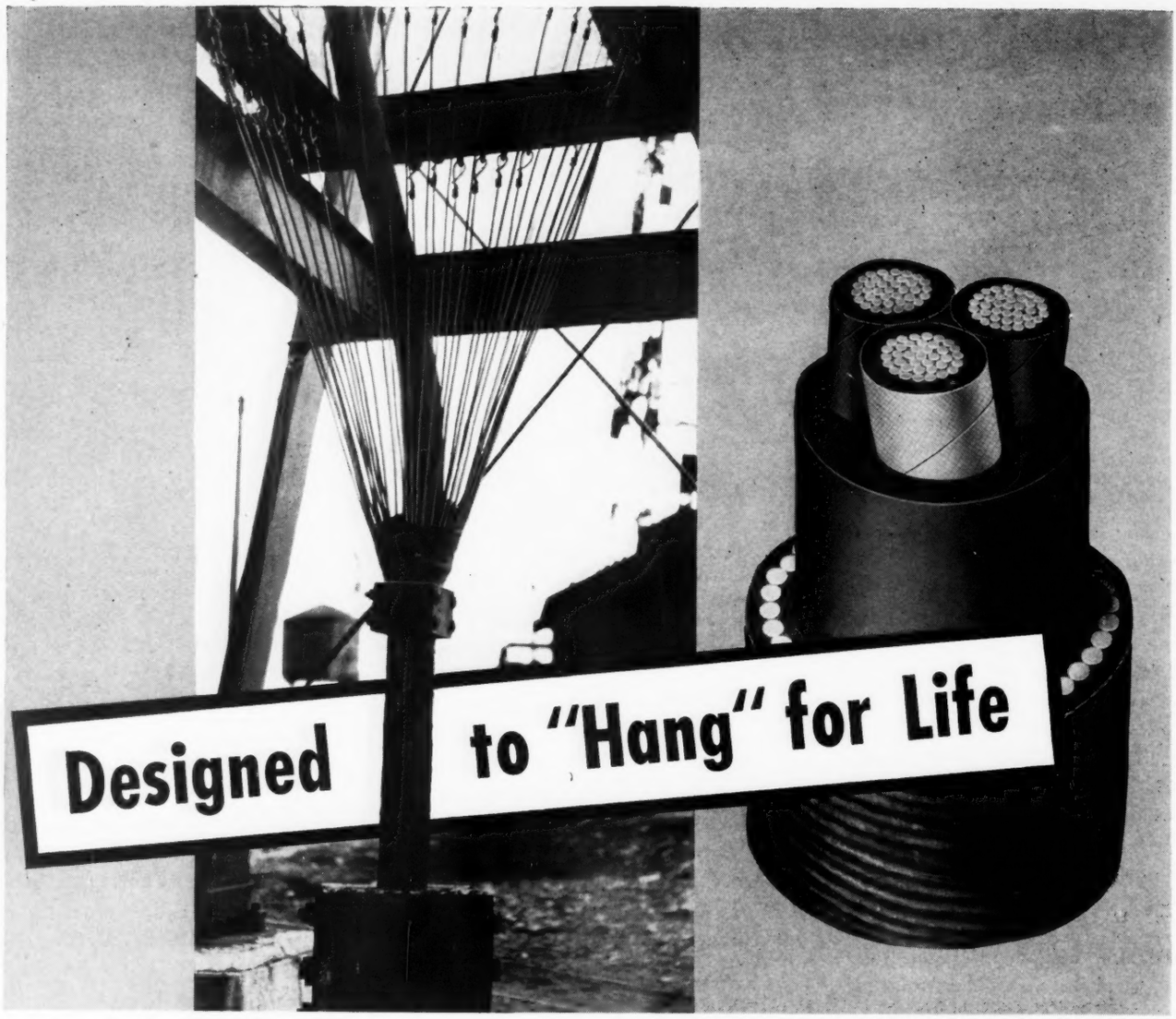


HAZARD
Borehole Cables

Hang this Hazard Mine Power Cable in the borehole or shaft and forget about damage from water, dirt, rocks, etc. The steel armor wires that add great strength and protection to this cable also make installation simple and fast. They are easily attached to eyebolts at the top of the borehole and thus suspend the cable safely and securely.

Hazard Submarine type rubber insulation is standard in these cables. Its unusual toughness, resiliency and moisture-resistance are why Hazard Borehole Cable is known for its long, trouble-free life.

There are Hazard Cables and Cords built especially for each electrical mining requirement. Send for the Hazard Mining Catalog and get all the facts today, including various designs of borehole cables and the methods for supporting them. Let Hazard Engineeers help you install, operate and maintain your electrical circuits in the most efficient way.

HAZARD INSULATED WIRE WORKS
DIVISION OF THE OKONITE COMPANY
Works: Wilkes-Barre, Pennsylvania
Offices in Principal Cities

HAZARD
Cables for Every Mining Use

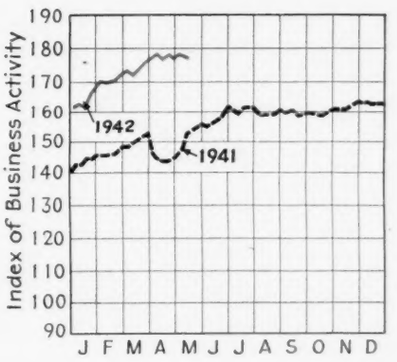
(CONTINUED FROM PAGE 5)

Cincinnati convention. Hereafter, Equipment Tips columns will carry short descriptions and photos of machinery and supplies directly affecting the war's coal production and maintenance efforts. . . . **Technical articles,** beginning p. 63, are not relegated to the discard by these changes in editorial presentation, because their timeliness and accuracy have long formed the backbone of Coal Age's structure. However, to make room for streamlined news and editorial comment, the number and length of technical articles will be curtailed. . . . **For instance,** a Richart two-pager is scheduled for early publication which cites provisions insuring increased safety in electric-power operation of mines, while a page of pictures and a page of text tells the story in a future issue of how five feeders were suspended in a borehole near Portage, Pa. . . . **Maintenance** by welding is particularly well covered in this number by Ernest Prudent, of Bell & Zoller Coal & Mining Co., and R. Dawson Hall's high-points and digests of papers presented and discussed at the Cincinnati A.M.C. meetings begin, p. 51, in the News Section and are continued in the back of the book. . . . **"Mogentor,"** p. 66, sounds funny, but Jack Edwards describes and explains it all. Ivan Given is back from the Far West with a good story or two of operations in and around the Rockies, so you will not lack the technical touches in future issues, either. . . . **Let us know** how you like it, please.

HOW'S BUSINESS

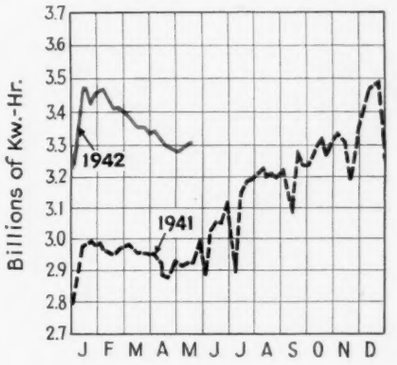
GENERAL BUSINESS CONDITIONS

With price ceilings in effect, production is subject to a two-way pull, according to *Business Week*—war output is rising persistently, but civilian output is declining. The Index has declined slightly and no great gains are immediately in sight. As more and more metal plants are converted to war needs, however, it is likely that there will be sharp advances. *Business Week* Index stood at 178.7 on May 16, compared with 179.3 for the preceding week and 179.6 a month earlier.



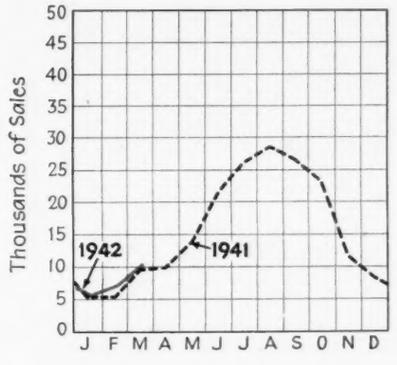
ELECTRIC POWER OUTPUT

Output of electric energy by the electric light and power industry for the week ended May 16, according to the Edison Electric Institute, was 3,356,921,000 kw.-hr., an increase of 0.2 percent over the preceding week and a gain of 11.5 percent over the corresponding week a year ago. Production for other recent weeks was: April 18, 3,308,000,000; April 25, 3,299,000,000; May 2, 3,304,000,000; May 9, 3,351,000,000 kw.-hr.



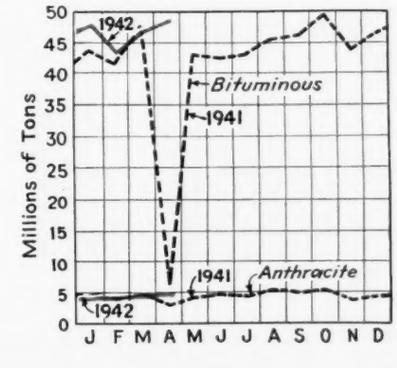
COAL STOKER SALES

Mechanical stoker sales in the United States in March last totaled 11,268 units (U. S. Bureau of the Census from 101 manufacturers), compared with 8,124 in the preceding month and 9,932 in March, 1941. Sales of small units in March last were: Class 1 (under 61 lb. of coal per hour), 10,210 (bituminous, 8,715; anthracite, 1,495); Class 2 (61-100 lb. per hour), 448 (bituminous 412; anthracite, 36); Class 3 (101-300 lb. per hour), 314.

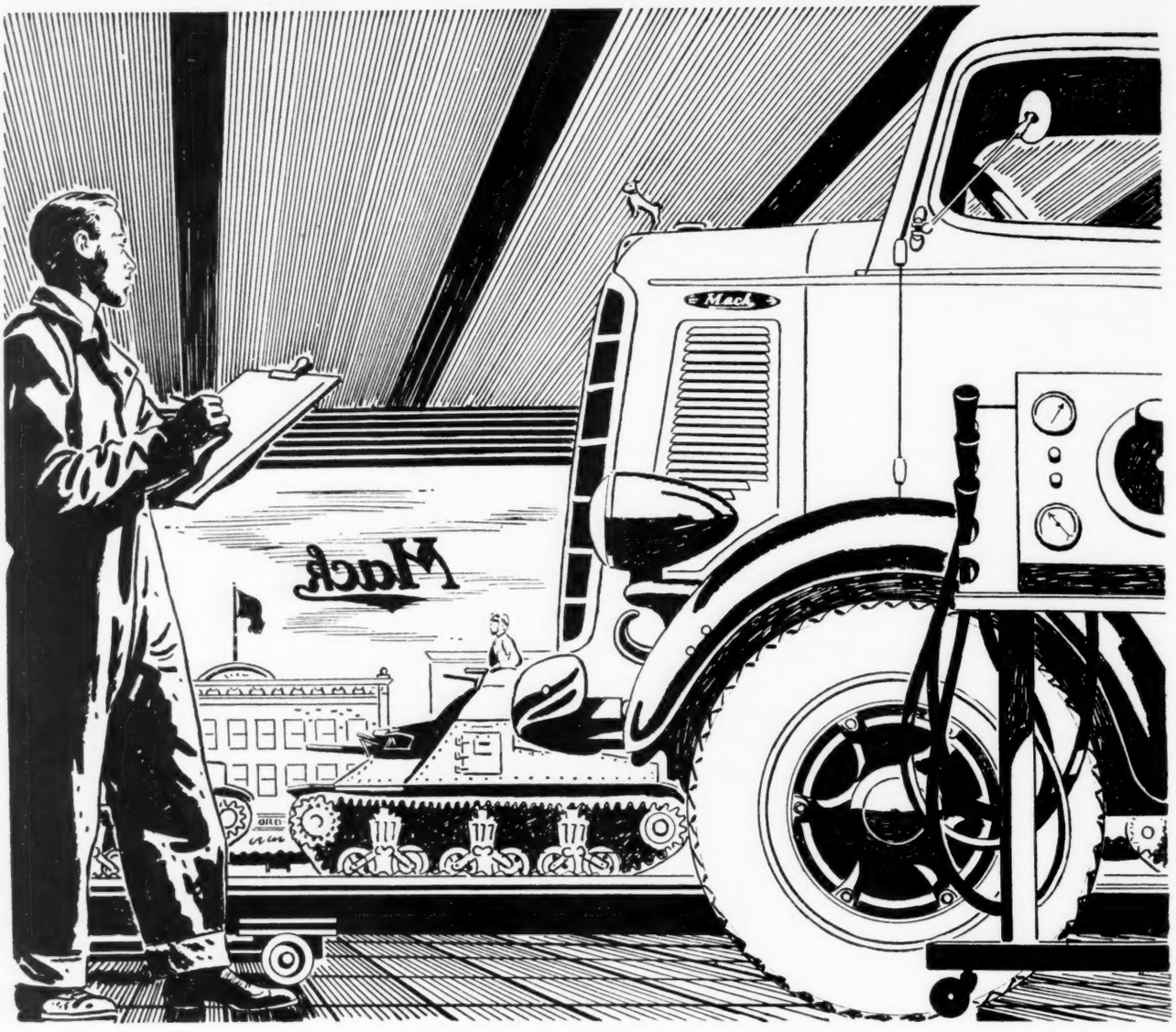


COAL PRODUCTION

Bituminous coal produced by United States mines in April last (preliminary) totaled 49,000,000 net tons, according to the Bituminous Coal Division, U. S. Department of the Interior. This compared with 47,400,000 tons in the preceding month and 5,975,000 in April, 1941. Anthracite tonnage in April last, according to the U. S. Bureau of Mines (preliminary), was 5,138,000, as against 5,085,000 (revised) in the preceding month and 3,198,000 in April, 1941.



Every hour of lay-up time saved brings Victory a little closer . . .



A Message to Mack Owners on Truck Maintenance

It's going to be increasingly difficult to replace trucks during the critical days that lie ahead.

You who own Mack trucks have the advantage of the extra durability that's built into them. (That Macks *do* last longer is proved by figures which show that 7 out of every 10 Macks bought ten years ago are still in profitable use. *R. L. Polk survey, as published in Automotive News.*) But you can't hope to get the most out of your Macks unless you have them serviced promptly—regularly—at the nearest Mack factory branch or Mack dealer.

Consult your local Mack service manager for helpful, constructive advice on how best to conserve your truck equipment. Ask him about the Mack "Preventive Maintenance Plan," a practical system of periodic inspection and adjustment, which will save you money on repair bills—keep your trucks on the road for extra thousands of miles.

Remember, a truck is something more than a private investment in time of war. As a part of our vital transportation system, it is a public responsibility. Let us help you "keep 'em rolling."

MACK TRUCKS, INC., LONG ISLAND CITY, N. Y.

THE MOST COMPLETE LINE OF TRUCKS IN THE WORLD—
1 TO 45 TONS AND ALL HEAVY DUTY!

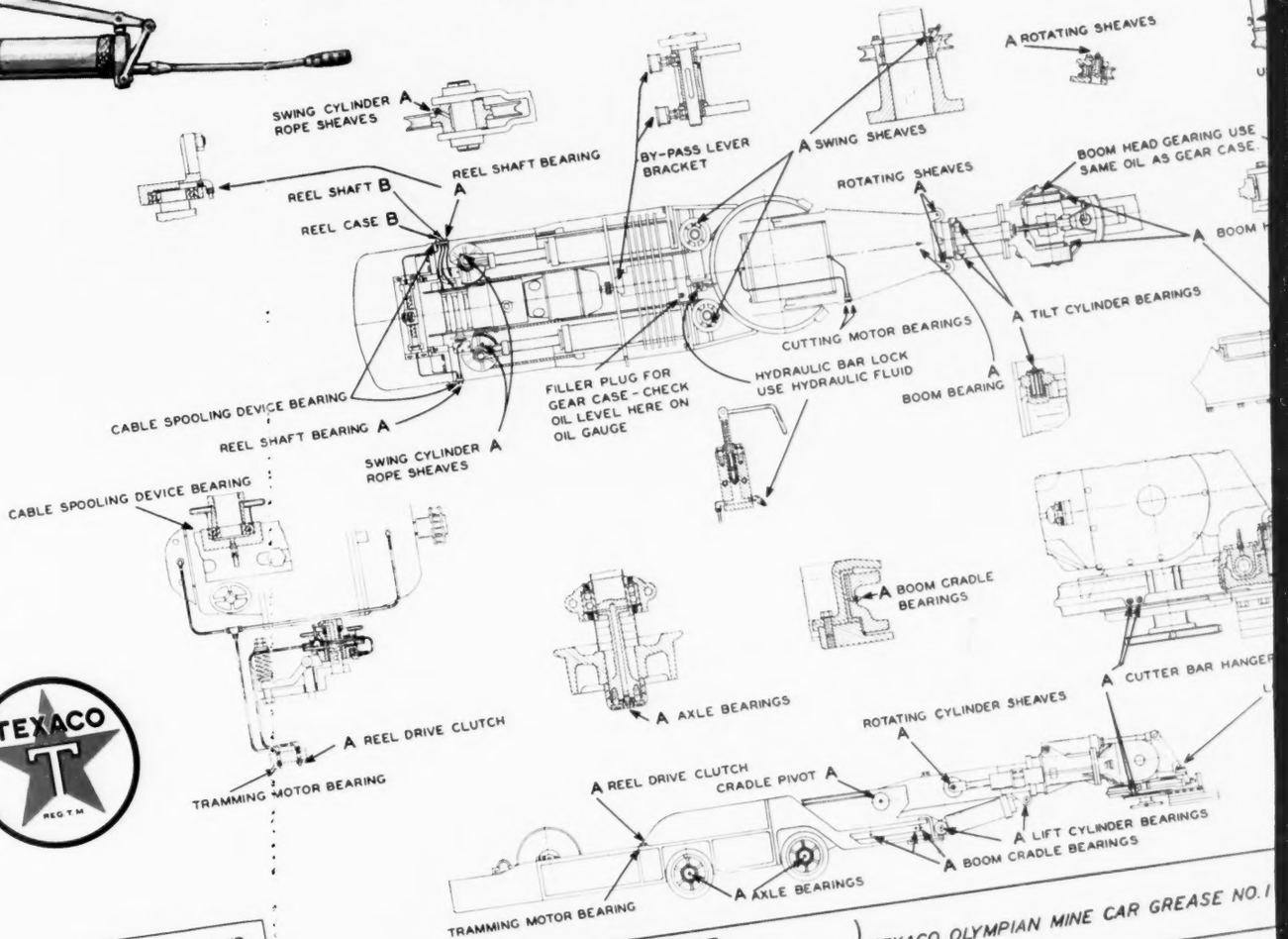
Mack

WAR-TIME MAI

Prevent Brea

TEXACO MAINTENANCE LUBRICATION CHART

SULLIVAN 7-AU TRACK CUTTER


SWING CYLINDER ROPE SHEAVES A
REEL SHAFT B
REEL SHAFT BEARING A
REEL CASE B
BY-PASS LEVER BRACKET
A SWING SHEAVES
A ROTATING SHEAVES
ROTATING SHEAVES A
BOOM HEAD GEARING USE SAME OIL AS GEAR CASE.
A TILT CYLINDER BEARINGS
CUTTING MOTOR BEARINGS
HYDRAULIC BAR LOCK USE HYDRAULIC FLUID
A BOOM BEARING
FILLER PLUG FOR GEAR CASE - CHECK OIL LEVEL HERE ON OIL GAUGE
CABLE SPOOLING DEVICE BEARING
REEL SHAFT BEARING A
SWING CYLINDER ROPE SHEAVES A
CABLE SPOOLING DEVICE BEARING
A BOOM CRADLE BEARINGS
A CUTTER BAR HANGER
A AXLE BEARINGS
A REEL DRIVE CLUTCH
TRAMMING MOTOR BEARING
ROTATING CYLINDER SHEAVES A
A REEL DRIVE CLUTCH
CRADLE PIVOT A
A LIFT CYLINDER BEARINGS
A BOOM CRADLE BEARINGS
A AXLE BEARINGS
TRAMMING MOTOR BEARING

TEXACO REG'T.M

HYDRAULIC FLUID
TEXACO REGAL OIL C

A POINTS GREASE EVERY SHIFT.
B POINTS GREASE EVERY 25 SHIFTS.
ALL OTHER POINTS GREASE EVERY 6 SHIFTS.

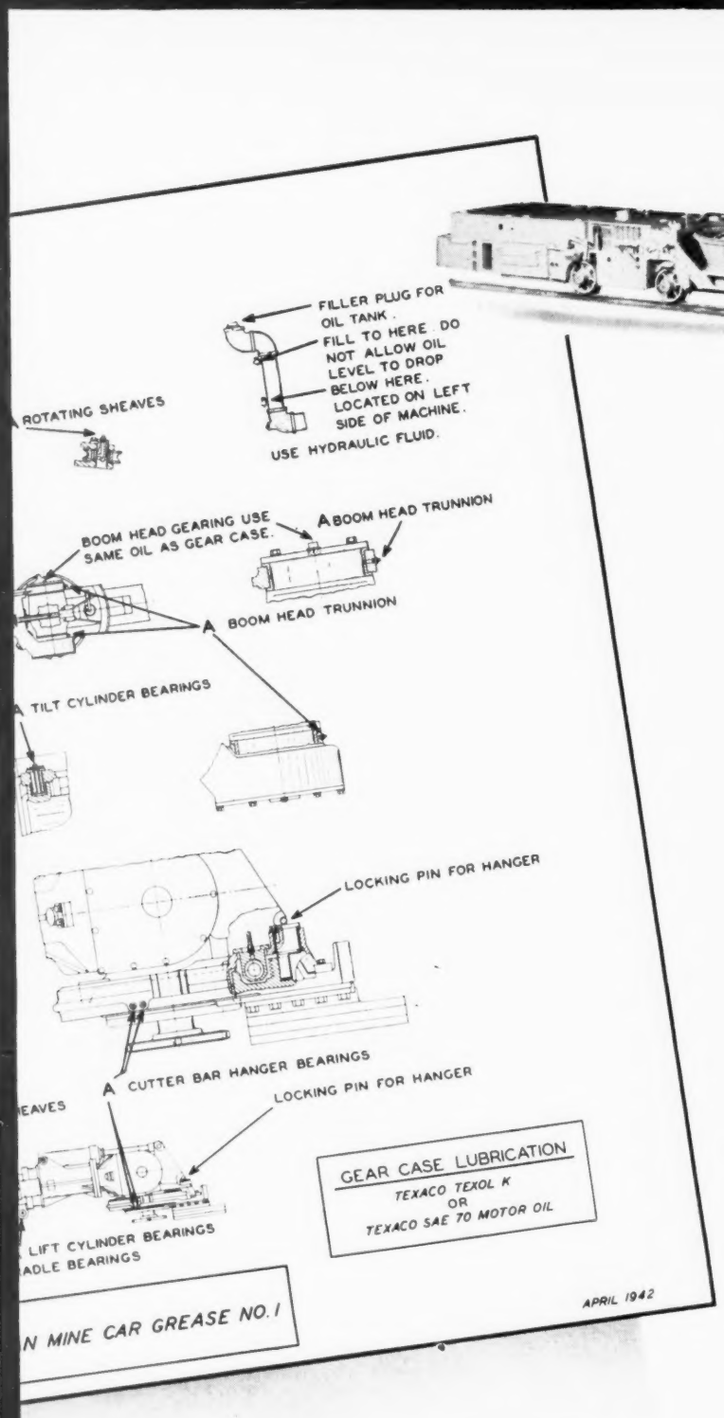
TEXACO OLYMPIAN MINE CAR GREASE NO. 1

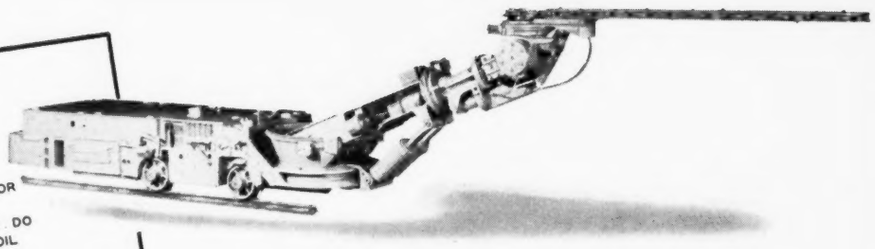
CHARTS FOR ALL UNDERGROUND MACHINERY ARE AVAILABLE

TEXACO MAINT

MAINTENANCE

breakdowns


FILLER PLUG FOR OIL TANK.
FILL TO HERE. DO NOT ALLOW OIL LEVEL TO DROP BELOW HERE. LOCATED ON LEFT SIDE OF MACHINE.
USE HYDRAULIC FLUID.
ROTATING SHEAVES
BOOM HEAD GEARING USE SAME OIL AS GEAR CASE.
A BOOM HEAD TRUNNION
A BOOM HEAD TRUNNION
A TILT CYLINDER BEARINGS
LOCKING PIN FOR HANGER
A CUTTER BAR HANGER BEARINGS
LOCKING PIN FOR HANGER
LIFT CYLINDER BEARINGS
GEAR CASE LUBRICATION
TEXACO TEXOL K
OR
TEXACO SAE 70 MOTOR OIL
N MINE CAR GREASE NO. 1
APRIL 1942



TEXACO MAINTENANCE LUBRICATION CHARTS

for cutters, loaders, locomotives, etc., are available at no obligation . . . Write for yours today

Your Cutters—Loaders—Locomotives—Etc., kept at maximum efficiency . . . for the duration, despite the lack of trained operators to lubricate them. That's the purpose of *Texaco Maintenance Lubrication Charts.*

Prepared by Texaco Engineers in cooperation with leading coal-mining machinery manufacturers . . . and constantly revised as designs change . . . these Lubrication Charts show exactly *where, when,* and with *what* to service each and every lubrication point in *your specific makes and models* of equipment . . . with products approved by the builder.

For *full-size* charts (18″ x 12″) covering the specific equipment you are operating (please give make and model), write, wire or phone The Texas Company, National Sales Division, Dept. C, 135 East 42nd Street, New York, N. Y.

MAINTENANCE LUBRICATION

FOR THE COAL MINING INDUSTRY

Your CUTTERS, LOADERS, LOCOMOTIVES

KEEP 'EM ROLLING

Buckled down to the business of producing coal at the rate of 660 million tons per year for the nation's war-time requirements, the coal mining industry must reach an unprecedented goal.

The necessity of maintaining mechanized equipment in 24-hour-a-day service, in many cases with untrained personnel, is a real problem.

On the inside of this 4-page announcement The Texas Company presents what it believes to be an important contribution to the maintenance of your coal mining equipment under these war-time conditions.

TEXACO'S BIG 4 IN COAL MINING

TEXACO OLYMPIAN MINE CAR GREASE

. . . keeps cars and equipment in service and out of the shop because it stays in wheel cavities and bearings. Contains high grade mineral oil, carefully refined. Its use reduces frictional drag; permits longer trains.

TEXACO CRATER

. . . keeps wire rope and open gears on the job . . . getting out more tonnage. It penetrates to the core of wire rope, coating each wire of each strand in a tough, wear-defying film that protects against wear, rust, corrosion. On open gears, Crater clings, following through from tooth to tooth, reducing wear, quieting noise.

TEXACO MARFAK

. . . protects bearings twice as long as ordinary "buttery" type lubricants. It seals dirt and water out of bearings, while it seals itself in, thus protecting against loss of lubricant. Withstands high operating temperatures.

TEXACO STARFAK

. . . keeps grease lubricated ball and roller bearings in ideal working condition, because of its resistance to oil separation, oxidation, gum formation. Saves power because of its low starting and running torque.

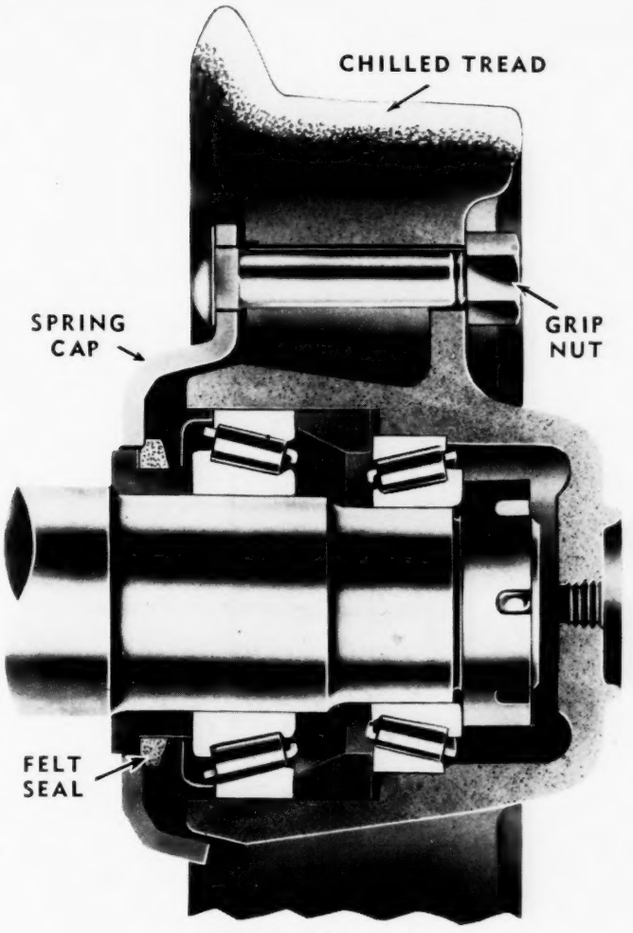
THE TEXAS COMPANY

TEXACO

AT LAST

A Perfected Demountable One-Piece Timken

See Timken's Own Ad Coal Age June '41



The NEW Sanford Day Timken

(Patented & Pats. Pend.)

• As the Timken Roller Bearing Company says—this is one of our latest developments in mine wheels —and it has provd itself a dandy.

Here, at last, you can purchase a "Demountable Wheel" equipped with rugged Timken Roller Bearings. This new S-D wheel has no loose front cap. Furthermore you can adjust the bearings on the axle and then put on the wheel and pull up the grip nuts on the retaining bolts as tight as possible without injuring the roller bearings in any way. You can also remove the wheel as easily at any time without touching the bearings or changing the bearing adjustment.

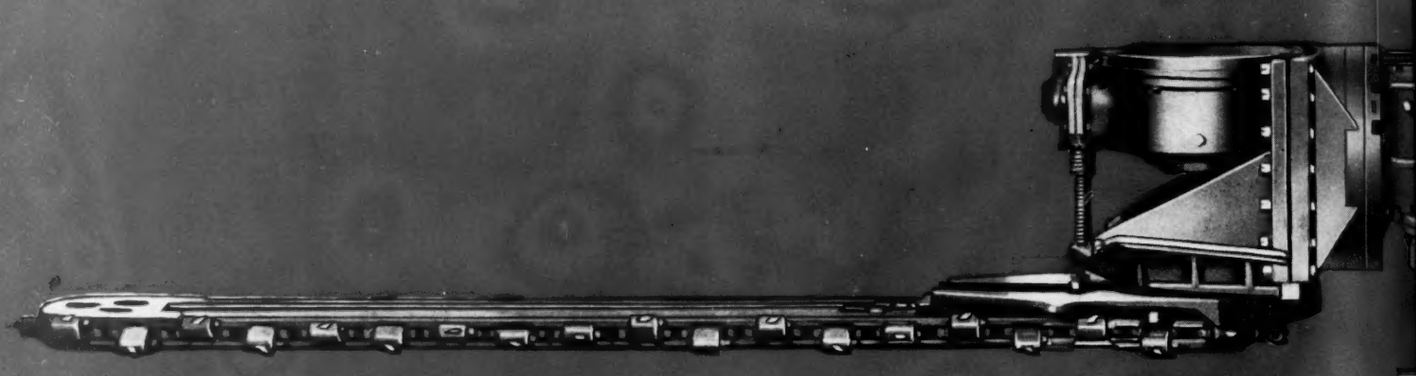
Finally, this wheel is equipped with our latest sealing method which holds grease several times as long as former seals used. You see no grease oozing out of the back hub of the New S-D Timkens.

Most all our Timken Customers are changing over to this so much better design—The New S-D Timken.

Sanford-Day Iron Works, KNOXVILLE, TENNESSEE

To Meet Every C

GOODMAN TRACK MOUNTED SL

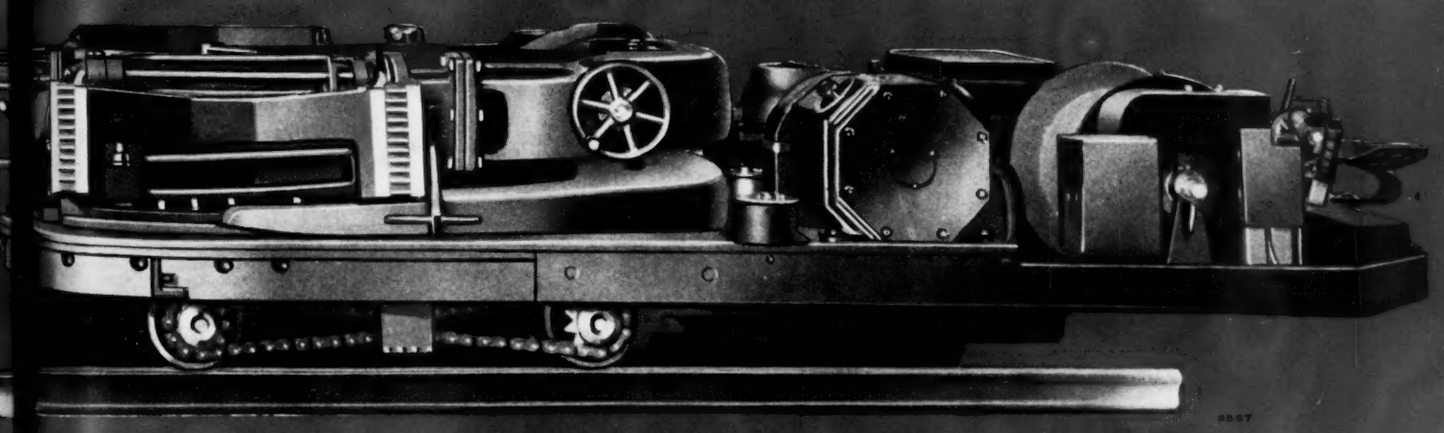


The Type 824 Slabber in a bottom cutting position.

GOODMAN MANUFACTURING COMPANY

Cutting Requirement

SLABBING MACHINES

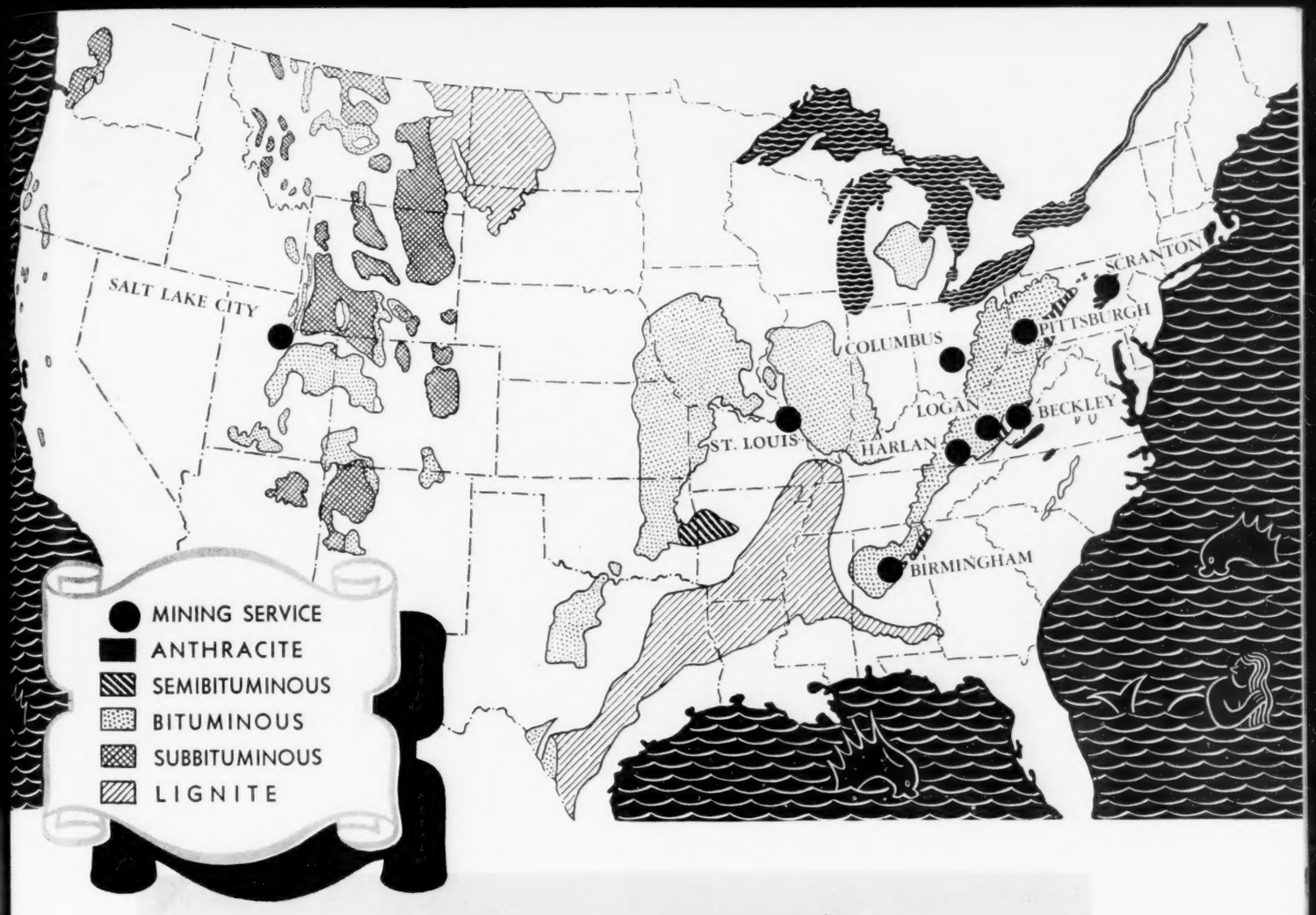


For bottom cutting, top and center cutting or a combination of these with shearing cuts there is a Goodman track mounted machine to handle the job with speed, economy and safety.

HALSTED STREET AT 48TH • CHICAGO, ILLINOIS

WHERE THERE'S COAL *There's* JEFFREY SERVICE

A typical group of Jeffrey Repair Parts illustrating a few of the many regularly stocked items available for prompt shipment from factory or field.



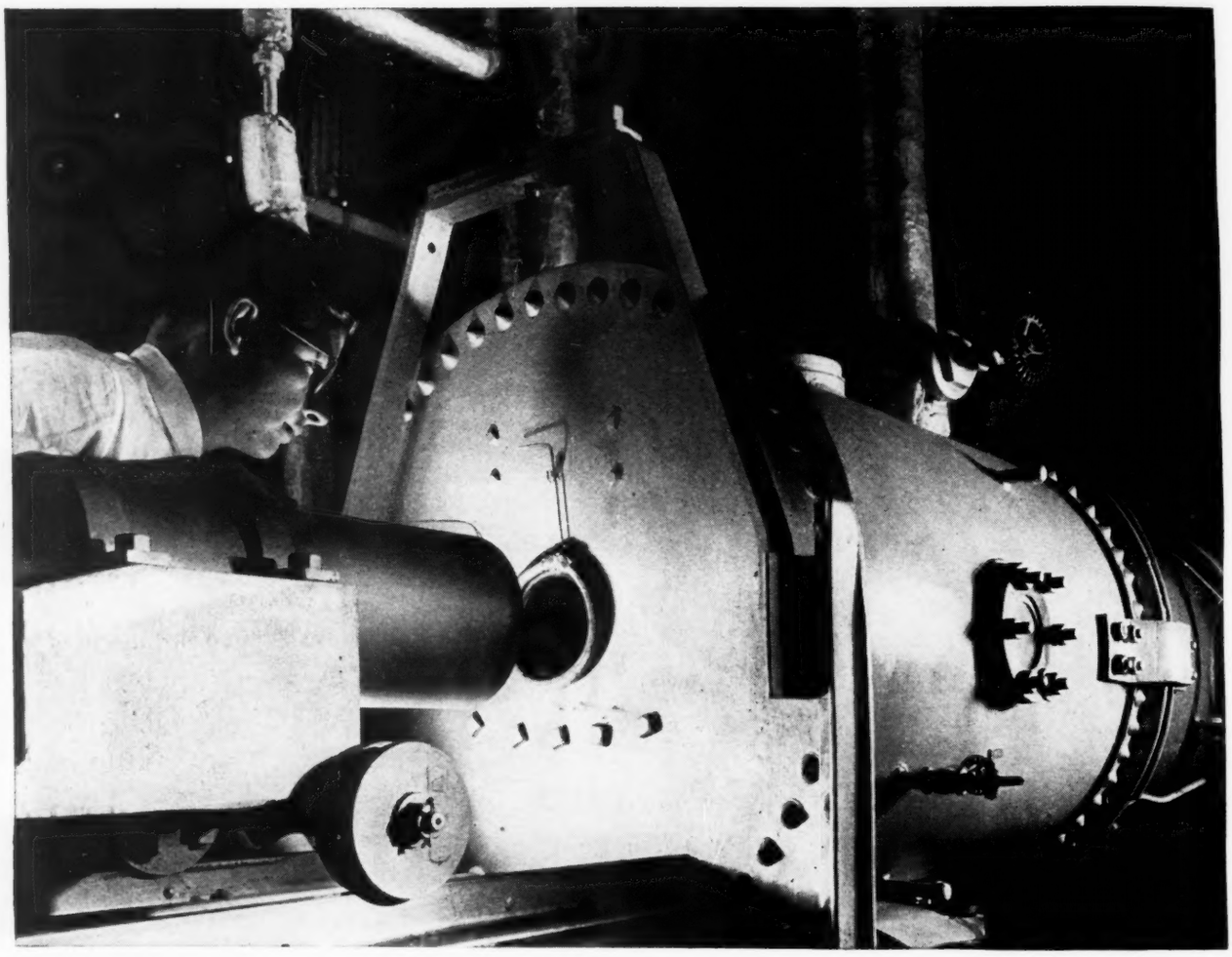
COAL IS VITAL *to the* WAR EFFORT

To maintain a constant flow of coal from each coal-producing area, Jeffrey has 9 warehouses strategically located to facilitate the delivery of repair parts for emergencies . . . Jeffrey genuine repair parts are always interchangeable and of the highest quality. » » » »

THE JEFFREY MANUFACTURING COMPANY

912-99 NORTH FOURTH STREET • • • COLUMBUS, OHIO

.....A BIG GUN



2 A SUPERIOR PRESERVATIVE FOR TIES AND TIMBER

Treating ties and timber with Du Pont "CZC" (Chromated Zinc Chloride) reduces maintenance costs and mine hazards at one and the same time. By preventing decay, "CZC" multiplies the life of ties and timber from 3 to 10 times, depending on conditions encountered. Room ties treated with it may be reused many times. And a completely treated main haulageway ends derailments due to tie decay and practically eliminates the need for track walking and maintenance. "CZC" also renders timber fire retardant and leaves it clean, odorless, easy to fabricate and safe to handle. For further information on this modern wood preservative, write for your copy of "Wood Preservation for Mines". Address: E. I. du Pont de Nemours & Co. (Inc.), Grasselli Chemicals Department, Wilmington, Del.

DU PONT
REG. U. S. PAT. OFF.

E. I. DU PONT DE NEMOURS

THAT SAVES LIVES!

Stories of 3 Du Pont Products That Increase Safety and Reduce Costs In Coal Mining Operations

1 PERMISSIBLE EXPLOSIVES

You might mistake this testing gallery at the Du Pont Explosives Research Laboratory for some strange new field piece—for it goes off with the roar of a cannon. Actually, it's a device for evaluating the safety of coal mine explosives.

Real progress in the development of explosives safe for use in gaseous and dusty coal mines began with the development of testing galleries—of which du Pont had the first to be established by an explosives manufacturer. Today, thanks to research carried on with equipment such as this, the safety of permissible explosives is unquestioned, when used in a permissible way.

Du Pont research has given permissible explosives many other advantages in addition to safety. For example, early permissibles were too fast—they shattered the coal—until du Pont chemists showed the way to the first slow, non-shattering permissibles with excellent spreading and heaving action. The result was an advance of tremendous economic importance to every operator.

Du Pont has pioneered many such improvements. The first low velocity, high count permissible—the kind that makes possible better distribution of the charge and reduces overloading—was introduced by du Pont, as was the first American gelatinous permissible for wet work and rock shooting. So too, the first semi-gelatinous permissibles that now do the work of gelatins, at a cost saving, were originated in the du Pont laboratories.

Today, du Pont research carries on—in the world's largest and best-equipped laboratory devoted to the development of industrial explosives. That laboratory—its trained staff—its backlog of experience—and its record of accomplishment—are a guarantee that you'll get the best in permissibles *first* by calling on du Pont.

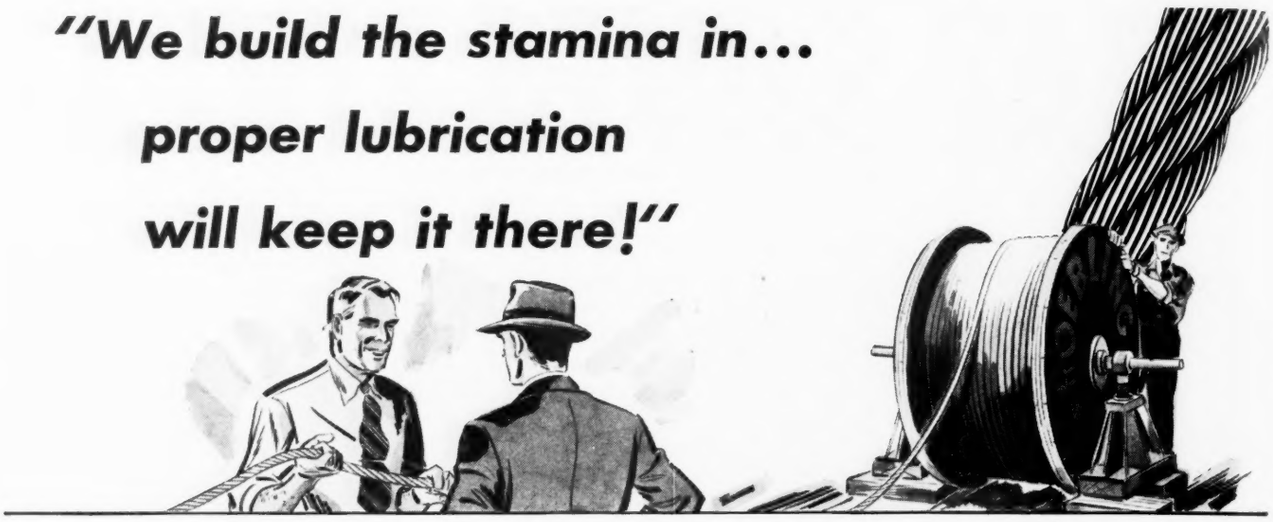
3 VENTILATION THAT'S FLEXIBLE AND EFFICIENT

The safest place in a mine is one that is free of poor air. These conditions are possible at the face only when adequate ventilation is maintained. This can be achieved by properly installed and operated auxiliary ventilation. Past experience has proved that the use of "Ventube"* as approved by various State Departments of Mines is an economical and efficient method of obtaining adequate ventilation for gangways and chutes, for chambers and rooms, when driving entries through faults, in driving through old workings, in reopening old mines and in advanced development. For complete details send for your copy of the new "Ventube" handbook. Write E. I. du Pont de Nemours & Co. (Inc.), "Fabrikoid" Div., Empire State Bldg., New York City.

*"Ventube" is du Pont's registered trade mark for its rubber impregnated flexible ventilating duct.

& Co. (Inc.) *Wilmington, Delaware*

"We build the stamina in... proper lubrication will keep it there!"

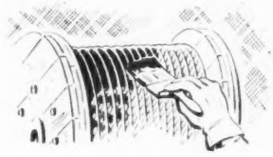


"Yes sir, Roebling 'Blue Center' Steel Wire Rope leaves our shops ready to give you the longest, lowest-cost rope service you can buy at any price. But, neglect it in service—give it the absent treatment as far as lubrication is concerned—and you are literally throwing good rope steel and a portion of your rope service out the window.

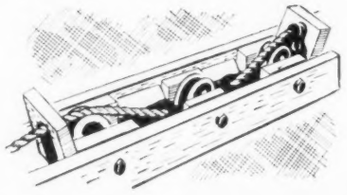
Pound for pound, wire rope probably has more bearing surface (inside the rope) than any other piece of machinery. Think of wire rope as a precision machine and you'll give it the same care as any fine equipment. All right, you say, what's the best type of lubricant to use—what's the best way to apply it?

As a starter, the best lubricant is one made specially for lubricating wire rope (never discarded crankcase oil!)... free from acids and corrosive elements . . . generally heavy-bodied, straight mineral lubricants of good penetrating and adhesive qualities. In addition, make sure it does not cake, gum or ball-up if contaminated with an excess of dust, dirt or metallic particles. And it must *not* thin down under high temperatures. If you're in doubt about what you're using, Roebling Engineers will give you recommendations as to the proper type.

Now, there have been lots of arguments about the best way to lubricate . . . principally because wire rope operates under such widely varying conditions. But here are some basic facts.



Some prefer to apply it with a brush. It's the simplest way—not always adequate but certainly better than none at all. If you brush, do it slowly, carefully, frequently . . . for it's the most difficult method to get complete coverage and penetration.



A better way is this simple three-sheave trough. It should be firmly fixed near the reel or drum, the lubricant applied hot and the rope run through not faster than 30 feet a minute. And, there are as many other good lubricating devices as human ingenuity can devise—to meet specific operating conditions.

One more pointer . . . be sure that your wire ropes are well lubricated when not in service—for when ropes are idle is when they are most susceptible to rust destruction. And, finally, set up a periodic lubrication and inspection schedule . . . so that you get maximum useful rope life . . . so that you get the extra service that has been built into every inch of wire rope that bears the Roebling Trademark . . ."

JR ROEBLING

Extra rope service from Roebling Research and Engineering, from the knowledge of men in the Roebling mills, of Roebling men in the field . . . they all add up to "Blue Center"—the Roebling wire rope that offers you lowest average operating cost per ton of material handled.

☆

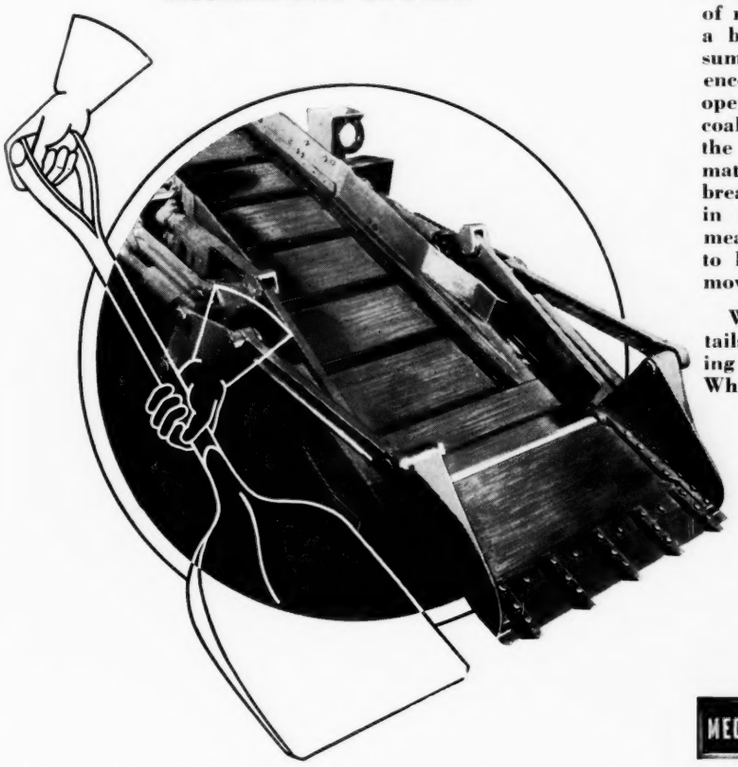
JOHN A. ROEBLING'S SONS COMPANY
TRENTON, NEW JERSEY
Branches and Warehouses in Principal Cities

ROEBLING
"Blue Center"
STEEL WIRE ROPE
PREFORMED OR NON-PREFORMED

PLAN AHEAD NOW!

MINING MEN ARE GETTING THEIR HEADS TOGETHER FOR 1942-43!

IN LOADING COAL . . . THE SIMPLEST, MOST EFFECTIVE, AND SAFEST ACTION IS WITH AN "AUTOMAT" MECHANICAL SHOVEL.



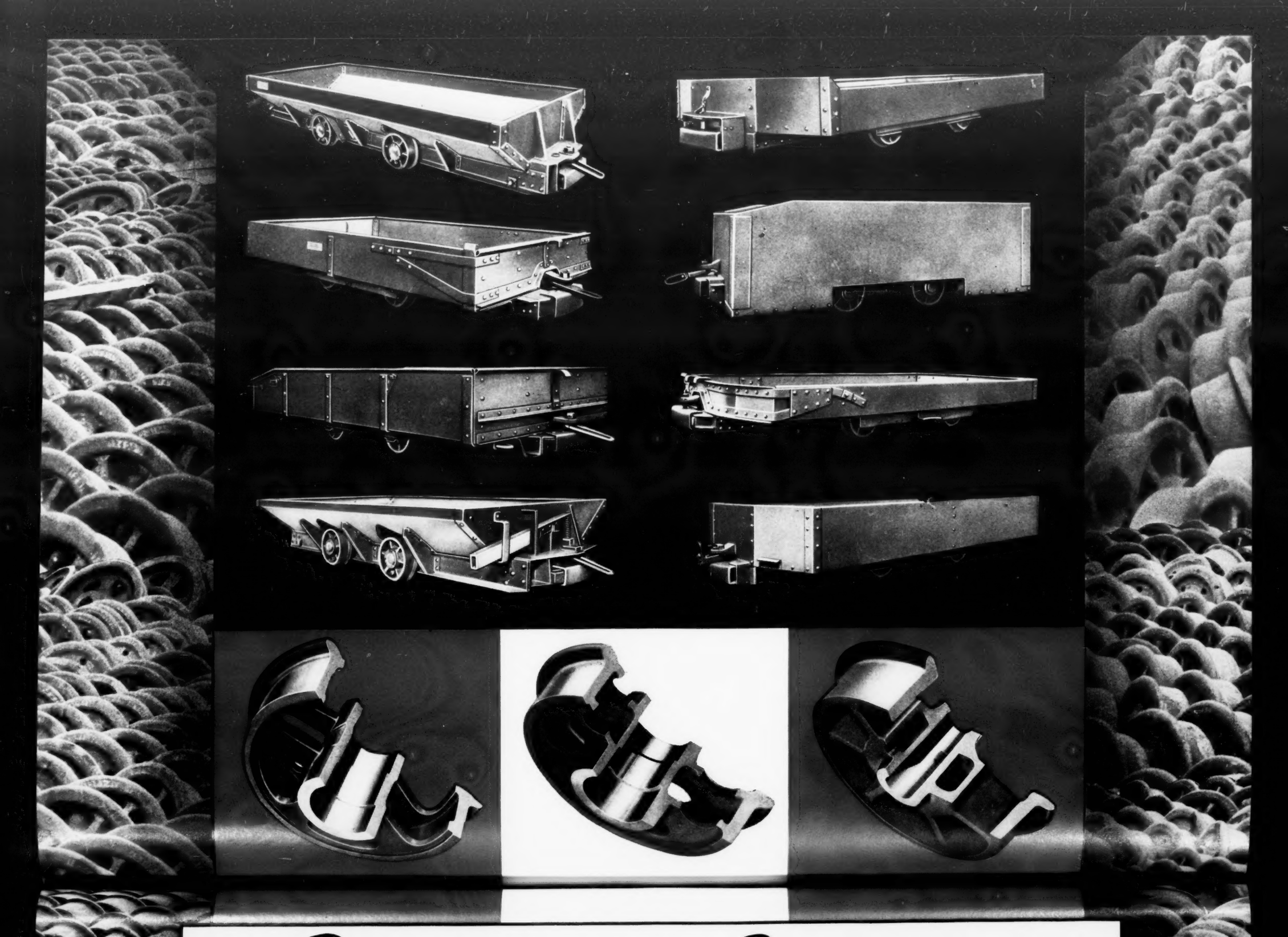
● Are you following the suggestion of the War Production Board and anticipating your requirement for equipment through 1943?

Whaley "Automat" loading machines are vital to essential increased production of coal and conservation of manpower. But that isn't all. While helping you do a big war job, the "Automat" will hold power consumption costs to the lowest point you've ever experienced because only one 25 H.P. motor is required to operate it, and only 1/5 KWH is required per ton of coal loaded. This low power consumption is due to the smooth but powerful shoveling action of the "Automat." This shoveling action accounts also for minimum breakage of coal . . . no dragging or crushing of coal in its operation. Furthermore, this shoveling action means safety to men. No sudden side kicking or jerking to knock out timbers, because the "Automat" shovel movement is always vertical.

Write for completely illustrated matter and full details of the "Automat." Advise us now what your loading machine requirements will be through 1943. Myers-Whaley Company, Knoxville, Tennessee.

MYERS-WHALEY CO.
Only an "AUTOMAT" Shovel

MECHANICAL LOADERS EXCLUSIVELY FOR OVER 33 YEARS



Production for Victory....—

We are doing our best throughout the coal mining industry to be of real service in furnishing cars and in the making of parts for reconditioning old cars • • • — Now more than ever before it is most important to get the best possible equipment because of the production that may be required later on • • • — Materials are most difficult to obtain • • • — Therefore, we urge our friends once again to consider repair parts for putting equipment in the best possible operating condition • • • — We are doing a lot of this business • • • — When the W.P.B. will grant the steel, deliveries of new cars will be prompt • • • — No parts order is too small—we will be glad to be of service • • • — Deliveries of parts will be reasonably prompt • • • —

Place your order now.

AMERICAN CAR AND FOUNDRY COMPANY

New York • St. Louis • Chicago • Philadelphia • Berwick, Pa. • Pittsburgh • Cleveland • Huntington, W.Va.

a.C.f.

Because accidents interrupt output—

Greater Safety *means* Increased Production

Imperative Today!

Every accident brings not only a measurable loss in man-power and man-hours—but often an equally serious loss in equipment-hours as well. And anything that reduces the effectiveness of America's production machinery is a vital concern today.

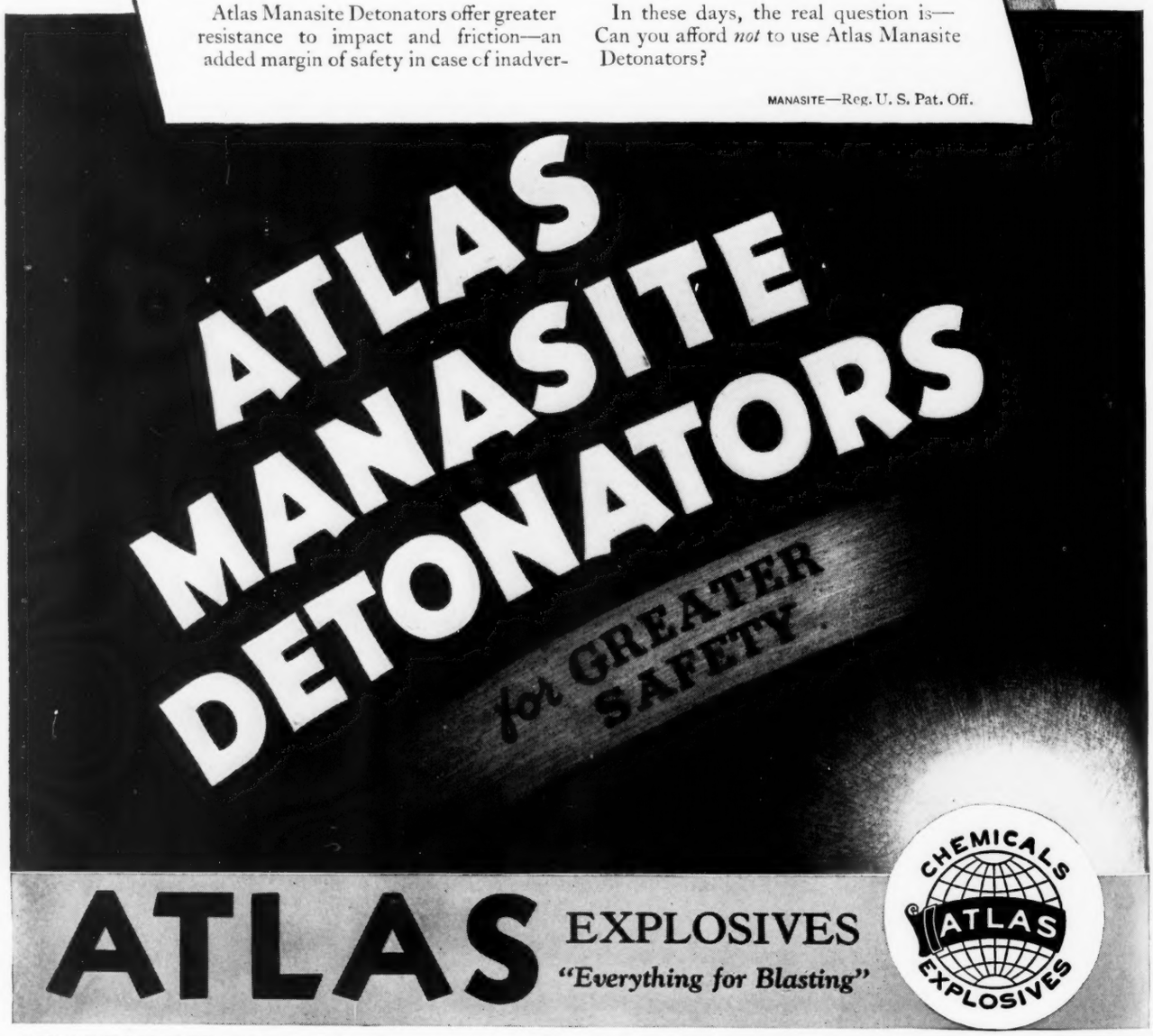
For this reason, the greater safety of Atlas Manasite Detonators becomes more important, more desirable than ever.

Atlas Manasite Detonators offer greater resistance to impact and friction—an added margin of safety in case of inadvertent mishandling. While no blasting cap can be called "safe," Atlas Manasite Detonators make safety precautions not less important—but more effective.

Furthermore, the adoption of Atlas Manasite Detonators requires no time-consuming changes in operating technique. And since they cost no more, you get more for your money.

In these days, the real question is—Can you afford *not* to use Atlas Manasite Detonators?

MANASITE—Reg. U. S. Pat. Off.



ATLAS EXPLOSIVES
"Everything for Blasting"

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington, Del. • Offices in principal cities • Cable Address—Atpowco

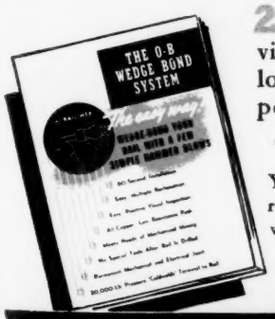
Give your production

A "SHOT IN THE ARM"

Step-up your face voltage with the O-B Wedge Bonding System

More coal, faster! Today, more than ever before, maximum output is a national necessity. Lagging, overloaded face motors have no place in a profitable peak production schedule. Insure a continuously adequate face voltage with the O-B Wedge Bonding System.

1 *The Electric Mobildrill* bores a sharp, clean hole through a 40-lb. rail in less than 40 seconds. Light weight, may easily be carried from joint to joint. Once drilled, rail may be used over and over again without further drilling, the bonding process becoming a matter of a few hammer taps.



2 *The Wedge Bond* provides a continuous, all-copper low resistance path through a permanent mechanical and electrical joint. May be installed in 60 seconds, a few hammer taps "cold-welding" the terminal to rail with 20,000-lb. pressure.

Yes, sir, the O-B Wedge Bonding System is a "natural" for operators who demand a continuously adequate return circuit. Investigate its advantages today. Write the Mansfield office for the new booklet offered on this page—or better yet, see your O-B representative and arrange for a trial installation at your earliest opportunity.

YOURS FOR THE ASKING — Want more information on how to keep your mechanized investment running at top efficiency? The above booklet describes the O-B Wedge Bonding System in detail, tells how it will fit into your bonding program. Just send in your request and we'll be glad to forward your copy immediately.

2298-M

OHIO B BRASS

MANSFIELD OHIO · U · S · A

Canadian Ohio Brass Company, Ltd. Niagara Falls, Ont., Canada

BUY United States Defense Bonds and Stamps

SULLIVAN 11-B SPEEDS F

in these THREE IM

1

FASTER HANDLING results from rope drums controlled by **LEVERS.** Machine runners appreciate the quick easy responsiveness of lever-controlled rope-drum frictions and minutes are saved in every shortwall operation. Sullivan has used this construction on shortwalls since 1936.

2

EASIER MOVING because it is the lowest and most compact shortwall in its power range which discharges cuttings at the rear. This means more room for the men, conveyors are brought closer to the fresh coal, bugdust is more easily handled and less timber has to be reset.

3

TROUBLE FREE OPERATION is assured by rugged construction. Note the large main bevel gear and motor pinion in the cutter chain drive. All moving parts are completely enclosed and run in a bath of oil.

Production begins at the face. Eliminate costly delays at this vital point with Sullivan 11-B shortwalls.

SULLIVAN ALSO MANUFACTURES THE 5B-1 AND 7-B SHORTWALLS, THE 7-AU

S SULLIVAN *Products* SPEED PRODUCTION for VICTORY

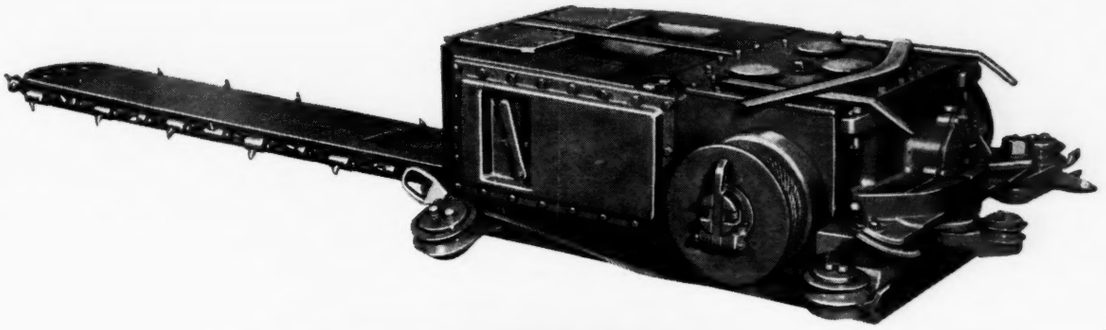
SULLIVAN

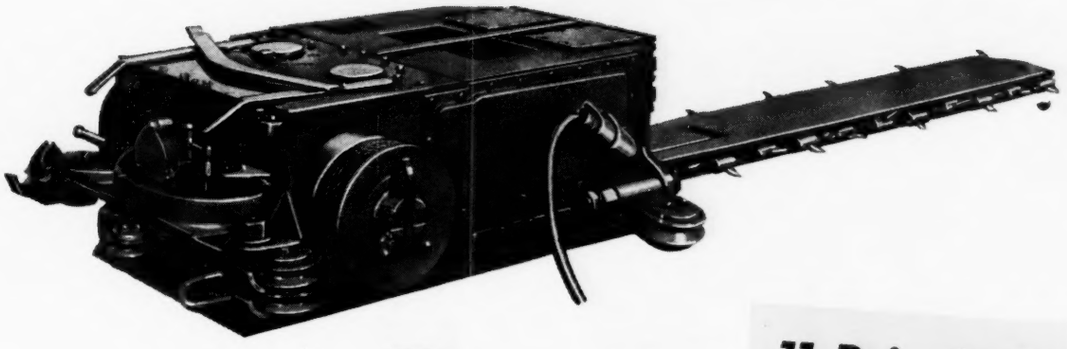
"WE SPECIALIZE IN COAL CUTTERS"

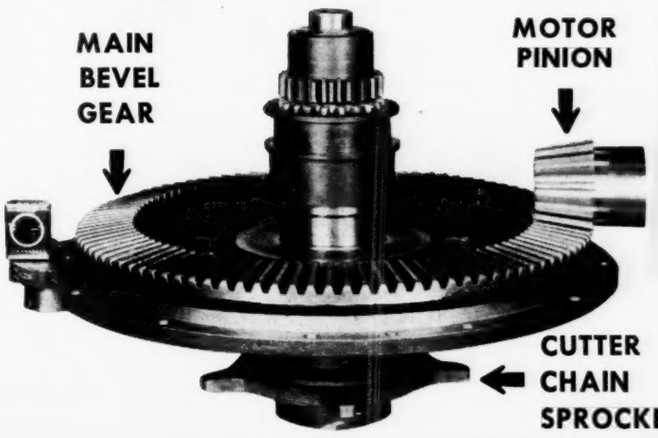
Coal Mining Machines · Scraper Haulers
Rock Loaders · Hoists · Car Pullers
Air Compressors · Rock Drills
Cutter Bit Sharpeners and Heaters
Core Drills and Core Drill Contracting.

FACE PREPARATION

IMPORTANT WAYS!







11-B is Only

21" HIGH
58" LONG
51" WIDE

UNIVERSAL TRACK CUTTER AND THE 9-B ADJUSTABLE FLOOR TYPE OVERCUTTER

SULLIVAN MACHINERY COMPANY

EXECUTIVE OFFICES — MICHIGAN CITY, INDIANA

Factories: MICHIGAN CITY, IND.; CLAREMONT, N. H.; GRANTHAM, ENGLAND

Associated House: CANADIAN SULLIVAN MACHINERY CO., Ltd., Dundas, Ont.

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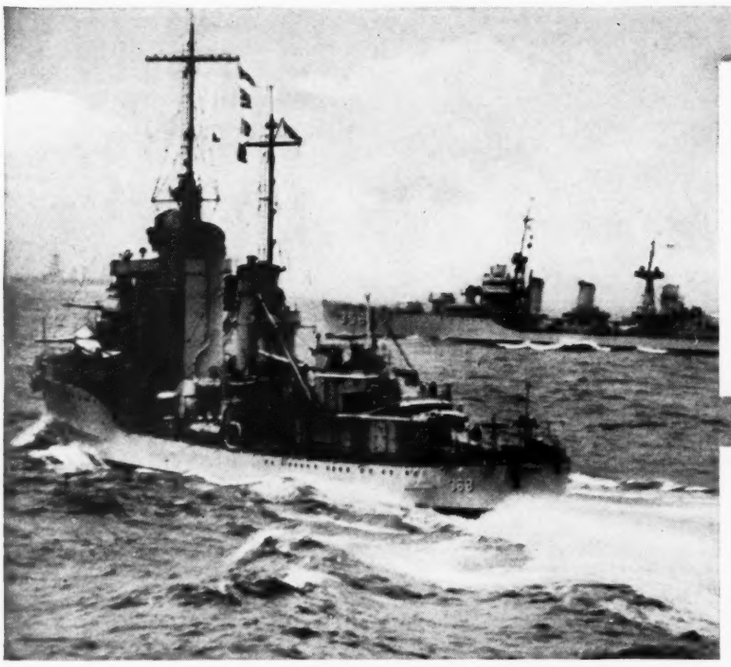
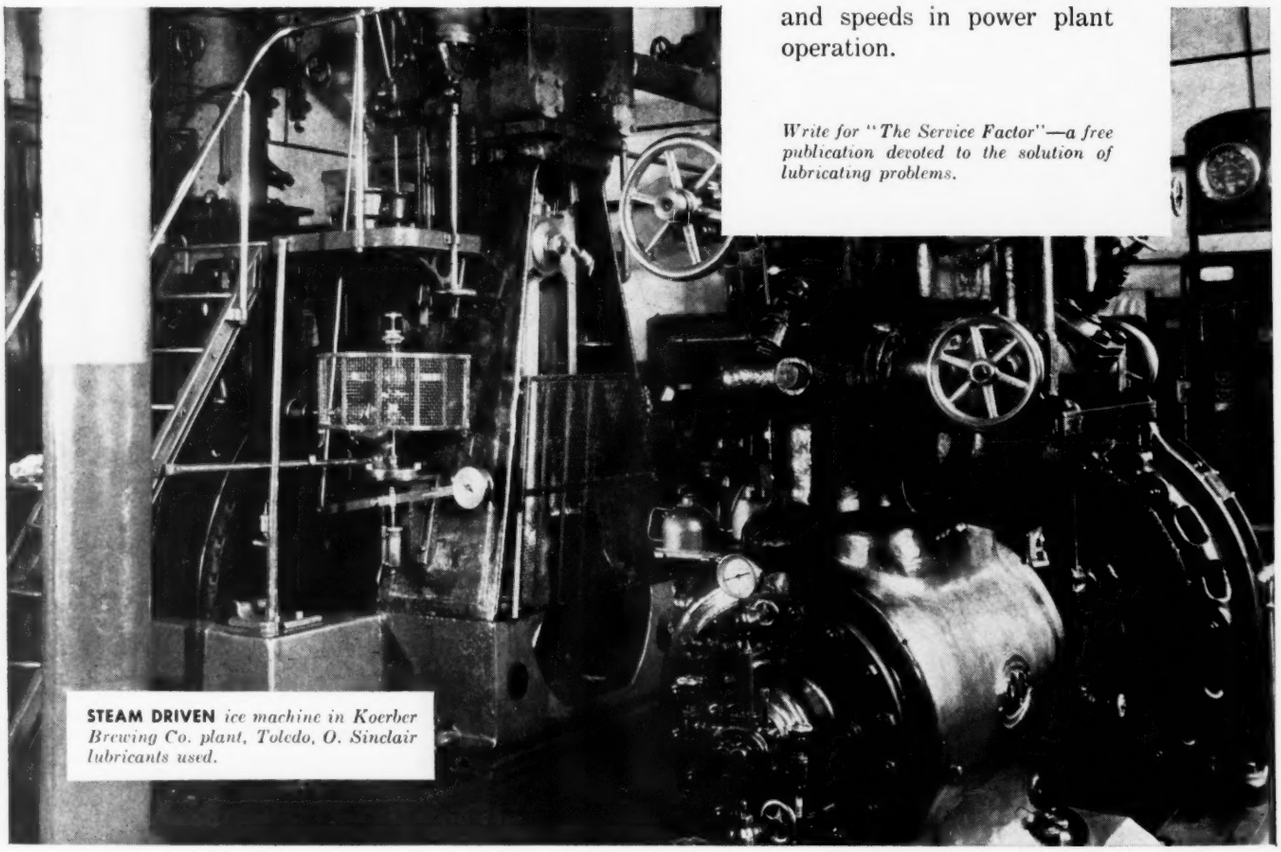


ALL-OUT WAR EFFORT demands maximum engine performance. For lubrication that helps *STEAM ENGINES* to deliver sustained full power output use . . .

. . . SINCLAIR STEAM CYLINDER and VALVE OILS. They are designed to meet every requirement of pressures, temperatures, moisture conditions, loads and speeds in power plant operation.

Write for "The Service Factor"—a free publication devoted to the solution of lubricating problems.



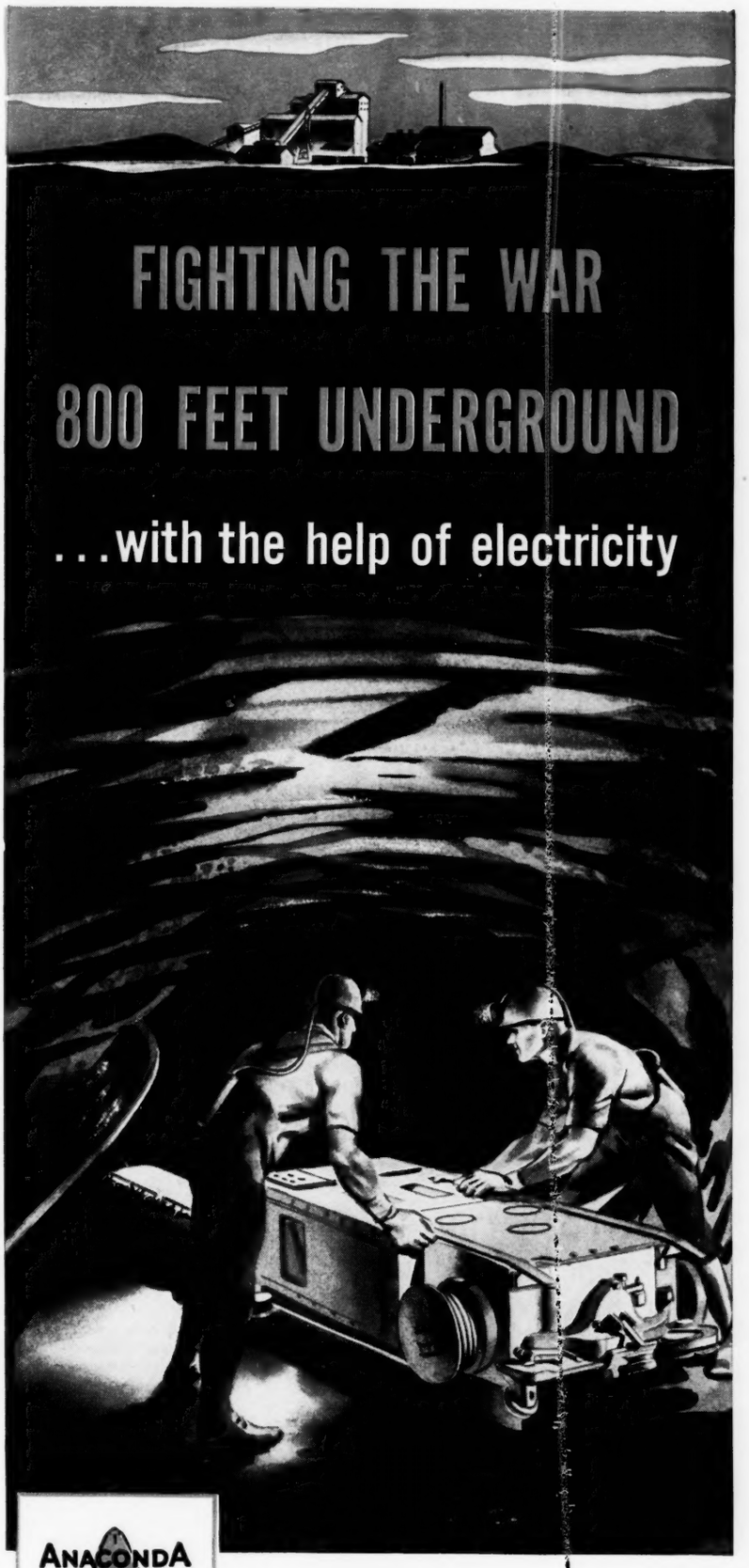
STEAM DRIVEN *ice machine in Koerber Brewing Co. plant, Toledo, O. Sinclair lubricants used.*

SINCLAIR INDUSTRIAL OILS

FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE NEAREST SINCLAIR OFFICE

SINCLAIR REFINING COMPANY (Inc.)

2540 West Cermak Road, Chicago • 10 West 51st Street, New York City • Rialto Bldg., Kansas City • 573 West Peachtree Street, Atlanta • Fair Building, Ft. Worth



In our nation's drive to victory, electrical power and the research-built Anaconda mining cables that carry it are helping vital mine production.

To keep mine production steady, operators use large quantities of electrical power . . . delivered through modern research-built wires and cables like Anaconda's tough, rubber-saving Duracord* and its all-rubber companion, Sunex Securityflex*.

Of particular interest today, with the conservation of rubber all-important, is Duracord. This construction was developed during the last war to meet the need for super-strength cords and cables. Its "fire hose" jacket, woven from long fiber cotton, makes Duracord tough on the outside—the weak spot in most cables.

The Duracord jacket makes possible rubber savings as high as 50% without sacrificing any efficiency. For further information, please write us immediately. 4225

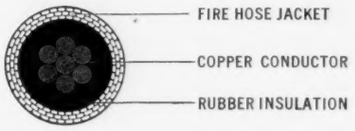
*Reg. U. S. Pat. Off.

ATTENTION!

Save Rubber with **DURACORD** *without Loss of Efficiency*

Here's a way you can effectively conserve rubber supplies and still get long-lived heavy duty electrical cords and cables . . . use Duracord.

This construction has served in some places for more than twenty years and it is still in use today. It is *not* a new construction.



ANACONDA WIRE & CABLE COMPANY
General Offices: 25 Broadway, New York City
Chicago Office: 20 North Wacker Drive
Subsidiary of Anaconda Copper Mining Company
Sales Offices in Principal Cities

ANACONDA
from mine to consumer

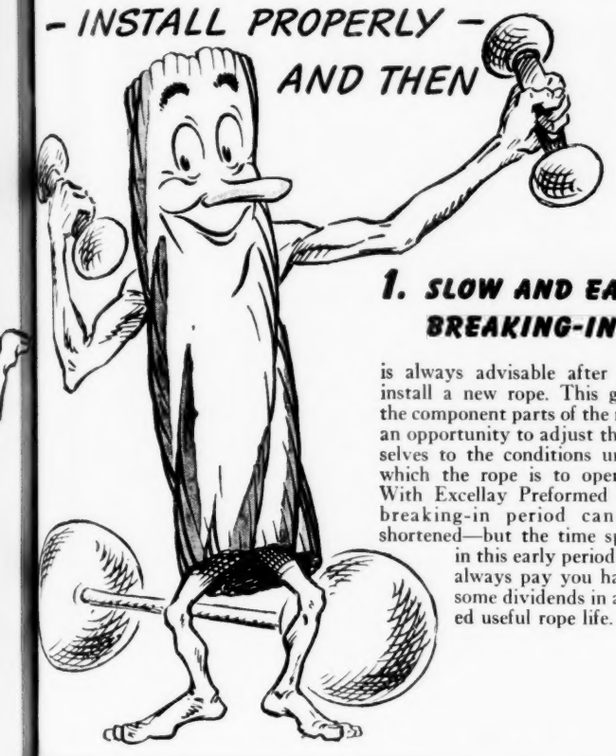
This familiar trade-mark symbolizes the best efforts of modern research and production.

Sunex Securityflex and Duracord

ANACONDA WIRE & CABLE COMPANY

"AMAZING"
said the inquiring reporter
"... to what do you attribute your long life, Mr. Tiger Brand?"
THAT'S EASY!
HEY FELLERS!
3. AND DON'T FORGET SHEAVES
—they are of prime importance in prolonging rope life. Your sheaves must be of ample diameter to prevent excessive bending stresses in the rope. Sheaves must fit the rope — too narrow grooves will pinch and distort the rope causing wear, internal stress and friction; with too wide grooves the rope will flatten from lack of support. Worn sheaves prevent proper seating and play hob with the best of rope. And sheaves need lubricating, too.
THIS IS MIGHTY IMPORTANT TOO!
4. AVOID EXCESSIVE FLEET ANGLES
Experience has proven that the best wire rope service is obtained when the maximum fleet angle is not more than one and one-half degrees. The maximum fleet angle is the angle between the center line of the sheave and the rope when it is at the end of its traverse travel on drum. A fleet angle of one and one-half degrees is the equivalent of approximately forty feet of lead for each foot of rope traverse travel either side of the center line of the sheave.
UNITED STATES STEEL

START WITH A GOOD ROPE LIKE ME
– INSTALL PROPERLY –
AND THEN

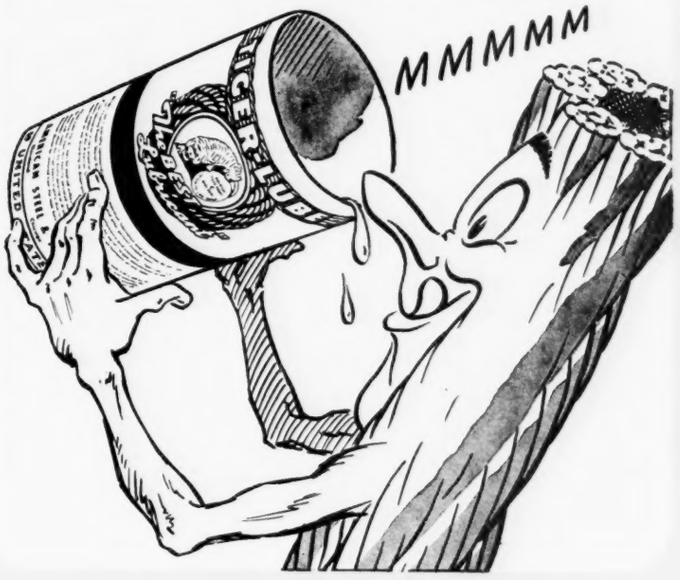


1. SLOW AND EASY BREAKING-IN

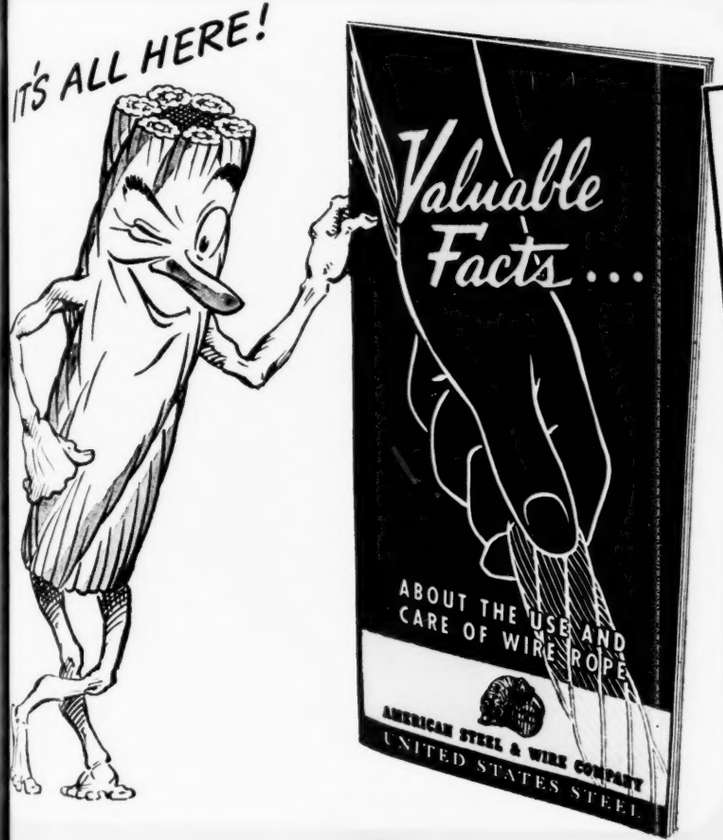
is always advisable after you install a new rope. This gives the component parts of the rope an opportunity to adjust themselves to the conditions under which the rope is to operate. With Excellay Preformed this breaking-in period can be shortened—but the time spent in this early period will always pay you handsome dividends in added useful rope life.

2. CORRECT LUBRICATION

This is mighty important because lack of proper lubrication is probably one of the most common causes for premature failure. Lubrication is required not only to protect the rope externally, but it must have sufficient penetrating power so that it will protect the inner wires against corrosion and friction. So be sure to give your wire rope periodical and careful lubrication with a good grade of wire rope lubricant, preferably with a well-tested product like Tiger-Lube. Such attention will assure better operation and considerably increased rope life.



IT'S ALL HERE!



SEND FOR NEW FREE BOOK

48 pages of Valuable Facts on Wire Rope Care which if followed will improve wire rope performance and definitely extend its useful life. The practical suggestions it offers are based on the experience of thousands of rope users. A copy in the hands of your operating men will save money for you . . . and in addition, by making wire rope last as long as it should, will help conserve rope supplies for other vital national requirements.

AMERICAN STEEL & WIRE COMPANY
Cleveland, Chicago and New York
COLUMBIA STEEL COMPANY
San Francisco
United States Steel Export Company, New York

Excellay Preformed

USS

Indispensable to America's war effort
...GOOD WIRE ROPE!

SINKER DRILLS TIME-SAVERS IN COAL MINE

A REAL ONE-MAN DRILL, CP No. 32 Sinker weighs only forty-seven pounds. Properly balanced, easy to handle, the 32 Sinker is the perfect drill for flat or upward drilling, taking up bottoms or general utility drilling requiring a hand-held tool.

LIGHT WEIGHT, HIGH SPEED, IDEAL FOR BRUSHING

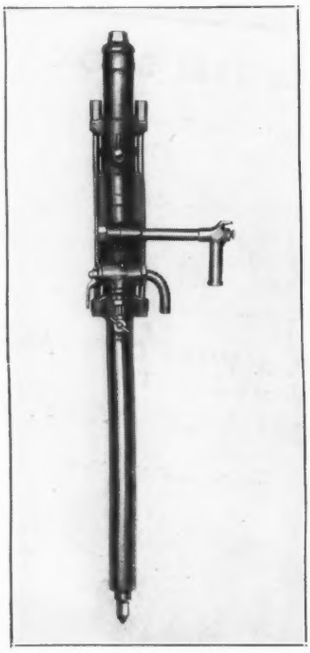
CP No. 32 Popular Model

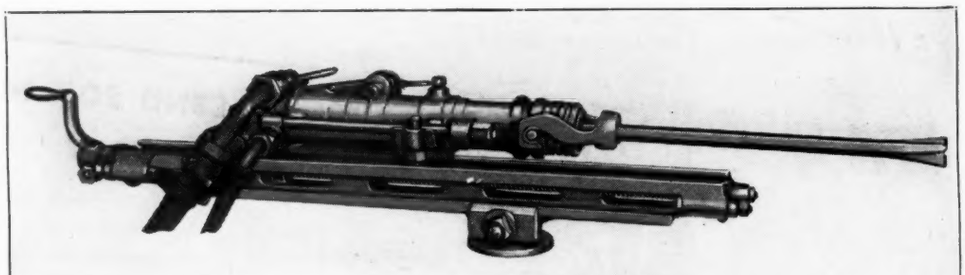
WEST VIRGINIA — Widely used for brushing, taking up bottom and a variety of utility drilling around the mines, CP No. 32 Sinker Drills are familiar tools in this district. Their light weight and ease of handling have made them popular with the miners. Their high speed, ease of control, penetrating blow and effective hole-cleaning reduce drilling time to the minimum.

CP No. 32 Sinker Drills are also used extensively in the anthracite region and other districts where conditions require rock drilling.

CHICAGO PNEUMATIC TOOL COMPANY

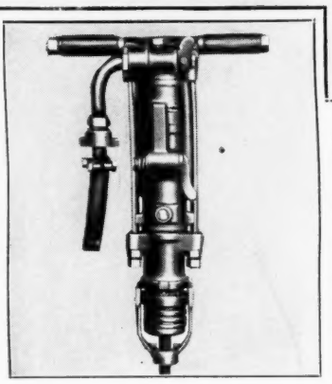
General Offices: 6 E. 44th St., New York, N. Y.





SYMMETRICAL IN DESIGN and well balanced. With the CP cradle and shell mounting, CP No. 32 Sinker Drill can be used for drifting through rock under coal beds. CP 32 Sinker has a flat back to facilitate horizontal drilling from a board.

THIS MEDIUM WEIGHT STOPER, CP No. 34, is a time saver in drilling rock to make way for overcasts. Feed control button in holding handle facilitates starting holes. Continuous blowing air keeps front end clear of cuttings. Has all the well-known CP features—fully cushioned piston, powerful rotation, automatic lubrication, and low air consumption.



FULLY CUSHIONED PISTON, bushings at points of wear, and an automatic lubrication system which distributes oil to all working parts, insure long life and low maintenance costs. Its unusually low air consumption makes the CP No. 32 Sinker Drill ideal for operation with portable air compressors.

CHICAGO PNEUMATIC

ROCK DRILLS

ALSO: Air Compressors, Pneumatic Tools, Electric Tools, Diesel Engines, Hydraulic Aviation Accessories

DRIFTERS
MOTORdrifters
AUTOdrifters
SINKER DRILLS
WAGON DRILLS
DIAMOND CORE DRILLS

McNally-Vissac Dryer...

COMPRESSED AIR TO AUTOMATIC TEMPERATURE CONTROL CIRCUIT
EXHAUST FAN
FEED HOPPER WITH ADJUSTABLE DISTRIBUTING FEED SPOUT
TEMPERING AIR INLET, WITH AUTOMATIC REGULATING DAMPER
ADJUSTABLE TEMPERATURE CONTROLLER
EXPANSION CHAMBER
FLUSHING CONNECTION
LOUVRE TYPE PULSATOR
ADJUSTABLE TEMPERATURE CONTROLLER

LESS HEAT! COST!
More Tph. of Rapidly Dried

OPERATION OF THE McNALLY-VISSAC DRYER

Hot furnace gases, tempered with cool atmospheric air, are drawn down through hoods suspended over two tandem shaking screens which are slightly declined and which shake in opposition. Gas seals, between the hoods above and hopper-ducts below, prevent air from entering while the dryer is in operation. As illustrated, each screen operates as a unit and has its own separate hood and hopper-duct system through which the hot gases are drawn by a McNally Pittsburg Exhaust Fan to be exhausted into the atmospheric air outside the dryer building.

These two separate duct systems, below the shaking screens, end at the patented Pulsator halfway between the screens and exhaust fan, at the point of ending in each duct there are usually two horizontal dampers which operate in opposition to the dampers of the other duct (see Fig. 1, pg. 43). These dampers constitute the patented Pulsator and operate as follows: as the dampers in one duct open, the dampers in the other close. This diverts the total flow of the furnace gases through the other open screen — the resultant pressure of these gases builds up tremendous force on the coal bed which literally clamps the bed to the screen surface and squeezes free moisture from it. Pressure is then released by the gradually opening dampers of the other duct which allows the coal to progress

ing the screen, partially suspended by the reciprocating ...n. The furnace gases then resume flow through the ...d material, coming into intimate contact with virtually ...es of each particle. ... rapid ... and ... the opening and closing of each ... interrupted regularly and at automatically controlled inter... da...

The alternating and overlapping stages of evaporation and pressure dewatering brought about by the PULSATOR permits the use of pressures that would completely stop coal travel and air flow if maintained continuously. At the same time this permits material on the screens to be re-arranged between successive pressure applications. All Packing or Matting of Wet Material within the Bed is ELIMINATED — this is essential in drying fine coal.

... final stage of drying, unheated atmospheric air ... through ... to cool the dried coal before ... dryer. Temperatures ... by automatic controls, within the hoods and ducts, which control the gas volume to suit drying requirements.

The water, or effluent, together with condensate collected in the duct system, is drained through water seals to a ...

FOR INFORMATION ON SPECIAL TYPE McNALLY-VISSAC DR...
WRITE McNALLY PITTSBUR...

42

McNALLY PITTSBURG

"CUSTOM BUILT PREPARATION PLANTS"

Postage Will Be Paid By Addressee

No Postage Stamp Necessary If Mailed in the United States

BUSINESS REPLY CARD

First Class Permit No. 12795, Sec. 510, P. L. & R., Chicago, Ill.

The McNally Pittsburg Mfg. Corp.

307 N. Michigan Ave.

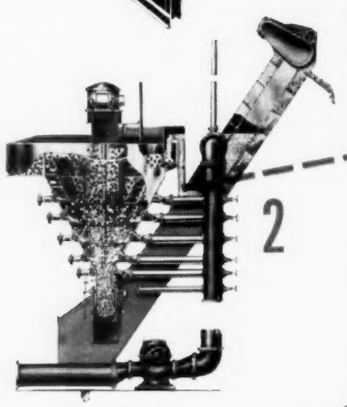
CHICAGO, ILL.

McNALLY PITTSBURG OFFERS YOU

3 types of washers

1

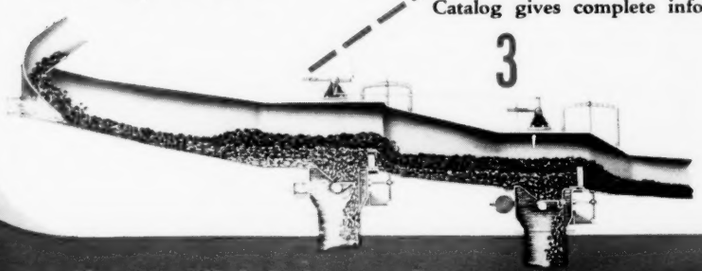
McNally-Norton Patented Washer—Accurately separates refuse from coal, providing uniform output regardless of variations in raw coal input. Available in following standard units:
Standard washers, capacity 75 to 350 tph
Compound washers, capacity 75 to 350 tph
Nut washers, capacity 25 to 300 tph
Unit washers, capacity 25 to 100 tph
Catalog gives complete data.



2

Menzies Cone Separator—Raw coal is fed into a cone. Water currents from a series of nozzles keep the coal in suspension. Refuse sinks to bottom and pure coal is floated over a baffle. Complete operating data given in the catalog.

McNally-Rheo Launder—Coal and refuse are automatically separated by stratification in the water stream. Washes coal up to five inches, although the efficiency is unsurpassed on fine sizes. Catalog gives complete information.



3

Actual installations with production figures are shown. Phantom illustrations of the important units of equipment demonstrate the principle of operation, which is explained in detail in the text. This valuable book is free. Mail the postage paid card for it today.

Every operating official in coal mining should have this 48-page book containing important operating data not found in a catalog

PLEASE SEND ME YOUR NEW 48-PAGE BOOK ENTITLED . . . *"PREPARE FOR PROFITS"*

Company _____

Your Name _____

Street _____

City _____ *State* _____

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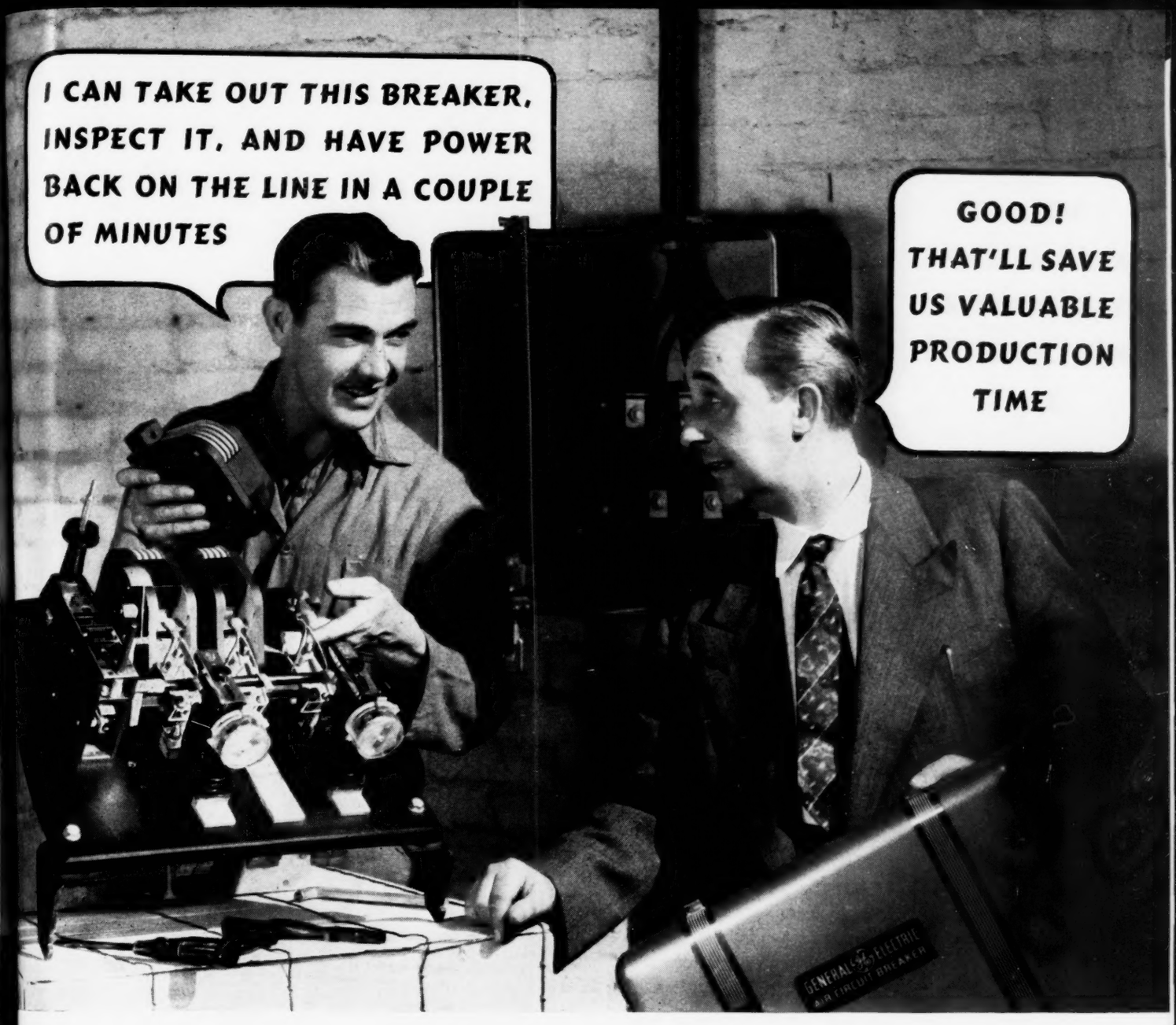

I CAN TAKE OUT THIS BREAKER, INSPECT IT, AND HAVE POWER BACK ON THE LINE IN A COUPLE OF MINUTES
GOOD! THAT'LL SAVE US VALUABLE PRODUCTION TIME
GENERAL ELECTRIC AIR CIRCUIT BREAKER

Here's Why This New Removable Breaker Is So Easy to Inspect

JUST loosen two screwbolts—and the complete breaker can be pivoted outward and lifted free, ready for inspection. It is just as easily replaced.

Simple? Yes—simple and easy to a degree which invites regular inspection. This discourages long-time neglect and avoids shutdowns, which are more costly today than ever before.

Plant engineers call it the 3-minute breaker. With it, you can reestablish service after temporary faults in less than one minute; inspect the breaker in safety, away from live parts—in less than two minutes; and where load conditions have changed, you can interchange breaker units in less than three minutes.

Give your production, equipment, and personnel complete protection. Install these breakers in lighting, power, and motor circuits—up to 600 volts. They will protect both the circuit wiring and the apparatus connected to the circuit. A new illustrated booklet (GEA-3600) tells where and how to use them. Ask the nearest G-E office for a copy, or address General Electric Company, Schenectady, N. Y.

THE BREAKER WITH THE DISCONNECT FEATURE

GENERAL ELECTRIC

860-22

Here's your Sturdier Tie for today's heavier machines...

BETHLEHEM No. 5 STEEL TIE

Just as mechanized operation has spread further and further through the industry these last few years, so the size and weight of mechanical equipment has been steadily increasing. That development has been all to the good so far as production goes, but it has played hob with trackwork that was never intended to take such heavy loads.

As loads got heavier, Bethlehem has kept on making larger steel ties to take the larger rail needed for room track. Now Bethlehem has developed the No. 5 Steel Tie. It's a sturdier tie all around, this new No. 5, with a heavier tie-section, bigger clips, stronger rivets—and it's designed to take rail weighing 40 lbs. per yd.

If you're having trouble with room-track maintenance, chances are you've been using too light a rail and tie for your rolling equipment and bottom conditions. That's where the new sturdy No. 5 Steel Tie can help you. It is $5\frac{1}{2}$ in. wide and $1\frac{1}{16}$ in. high, and weight of section is 5 lbs. per ft. For information write to Bethlehem Steel Company, Bethlehem, Pa., for Folder 475-A.

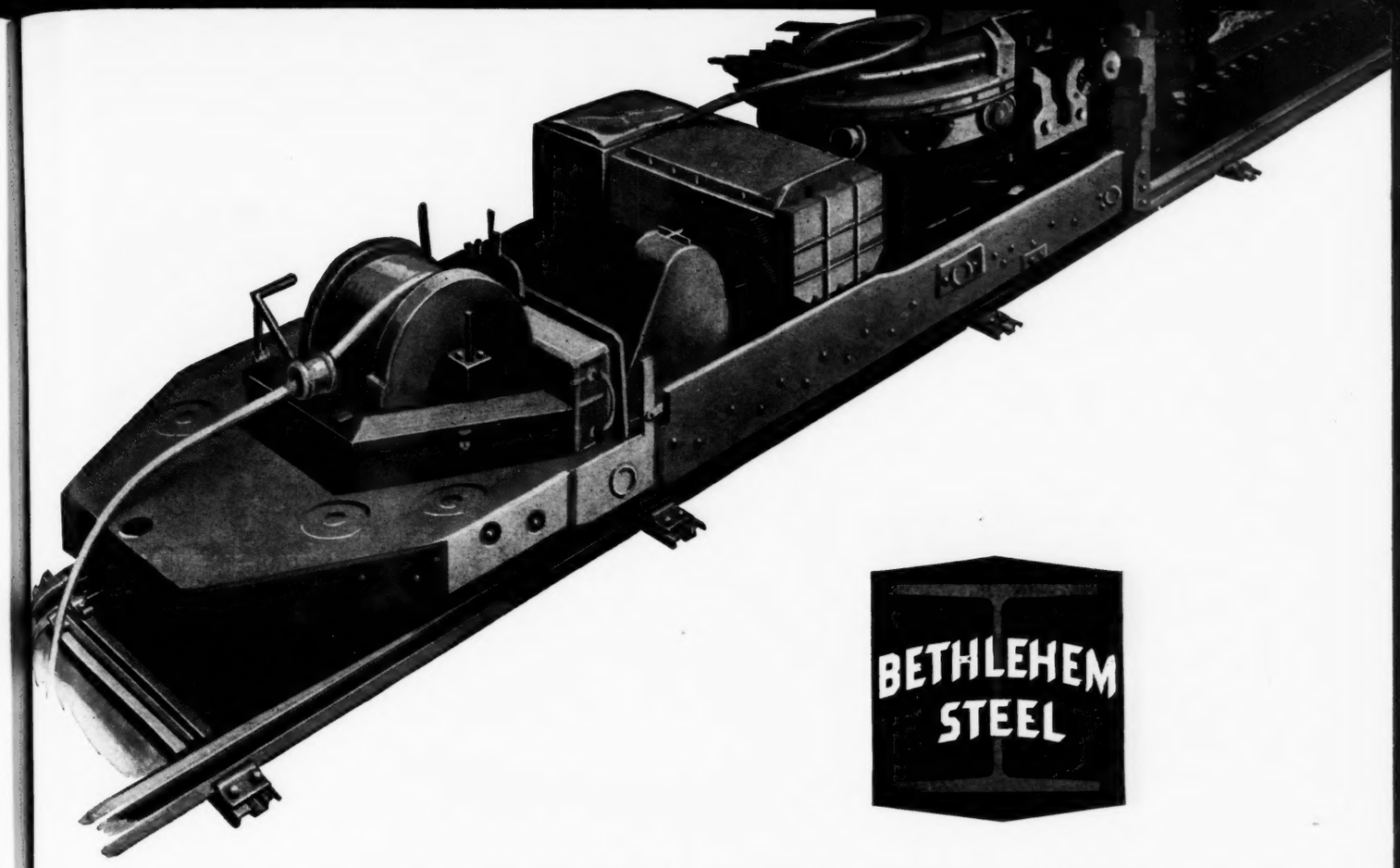
PURPLE STRAND FORM-SET WIRE ROPE IS MORE EFFICIENT

When you buy a length of Bethlehem Purple Strand Form-Set wire rope you can definitely count on two things.

First, you'll be getting the strongest, toughest, most fatigue-resistant rope in commercial use. The steel in Purple Strand Rope is 100 per cent improved plow steel.

Second, you'll be getting a rope that's easy to handle. Purple Strand Form-Set is pre-formed. Forming the individual strands before the rope is woven makes Purple Strand Form-Set limber, relaxed, easy to handle. It spools freely, doesn't need to be "seized" for cutting or splicing. It won't "porcupine."

Added up, these two points make a rope that's hard to beat for efficiency. And right now, with sleeves everywhere rolled up for maximum war production, really efficient wire rope is more important than ever before.



BETHLEHEM STEEL

BETHLEHEM-DARDELET RIVET-BOLTS HELP SPEED CONSTRUCTION

A few blows with a maul, a few twists with a wrench and a Bethlehem-Dardelet Rivet-Bolt is securely fastened. This method is now speeding steel erection on many new mine buildings, conveyors, headframes and dredges.

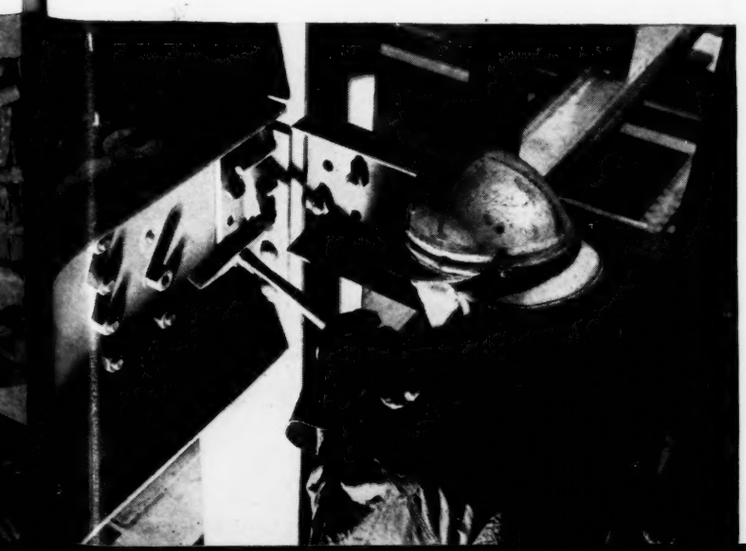
Bethlehem-Dardelet Rivet-Bolts save time; as many as 19 have been installed per man-hour. They require little equipment; a maul and a wrench do the job. No forges or compressed air are needed. A two-man crew can install Bethlehem rivet-bolts after bolting up the structural steel.

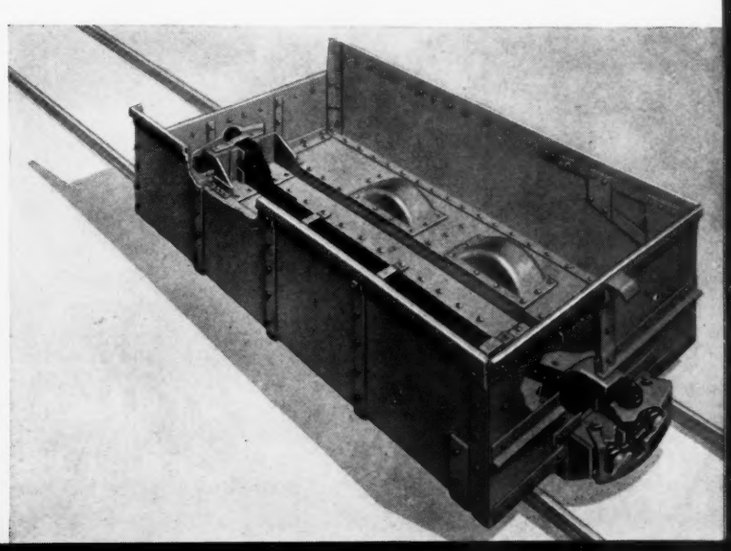
This bolt holds fast permanently because it has a ribbed grip section with an outside diameter slightly greater than the hole into which the bolt is driven. The nut holds fast because its unique Dardelet thread locks securely to the bolt when wrench-pressure is applied. Bethlehem-Dardelet Rivet-Bolts are made with button head, countersunk and special heads.

NEW BETHLEHEM MINE CAR STANDS UP IN HARD SERVICE

Ability of a mine car to stand up in hard service depends on more than massive strength. Details of design are vitally important, too. In the new Bethlehem Mine Car, we didn't depend on increasing the weight and strength of the bottom and ends to give assurance against pulling out. We went further and developed a radically new design, a mine car with unique features that give it added strength.

Bethlehem's new car has a floating drawbar—a sturdy steel member running free from end to end and transmitting pulling load and shocks to draft springs that cushion the jerks and even out the bumps. Because of that feature, ends carry no pulling load at all, giving the new car the equivalent strength and stamina of a far heavier car. For protection from the corrosive action of the coal, dual draft springs are located on the outside of the car body.





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stringers in beds of this gangue, whereas in other parts only small seams of gangue separate successive beds of high-grade material.

Experimental work has been done on rejected [illegible] carbonate ore, [illegible] (4) the mine-run black oxide ore. The chemical analysis of each of these types of ore as used for the concentration experiments is given in Table I.

High-Grade, Sorted, Carbonate Ore—This sort represents the best grade

Table I—Analyses of Ores

Type of Ore	Mn	Insol.	S	Al_2O_3	Fe	CaO	Zn	P
Sorted carbonate ore	33.8	8.3		4.0	4.5	3.7	No	0.092
Composite, medium-grade, carbonate ore	22.9	25.3	.7	11.3	6.8	2.6	No	0.201
Low-grade carbonate ore	14.9	47.5	5.6	17.7	4.4	2.7	No	0.120
Black oxide ore	28.3	28.8	3.2	7.4	7.2	2.2	No	0.229

Table II—Results of Sintering

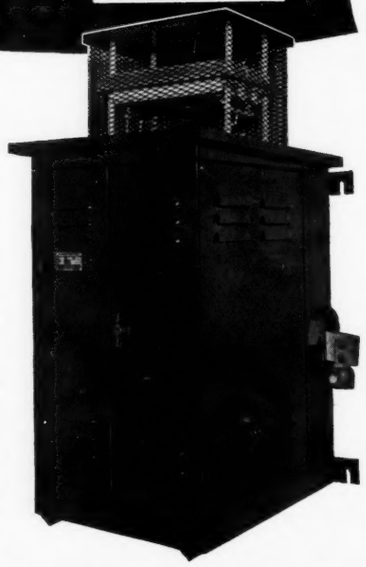
Product	Assay Percent Mn	SiO_2	Fe	Al_2O_3	P	Zn
Carbonate ore sintered directly	48.0	5.6	6.8	4.3	0.135	No
Declined carbonate ore, minus-10-mesh sands	50.3	[illegible]	6.8	3.3	0.110	No
Specifications, Grade D, ferro-grade manganese	[illegible] in.	ax. 10.0	Max. 7.0	Max. 6.0	Max. 0.18	Max. 1.0

TO MINE THE MOST

SECTIONALIZING CIRCUIT BREAKERS will add to your war production tonnage

In sectionalizing service, Type KSC circuit breakers help production by providing much better continuity in the operation of mining, loading and haulage equipment. Fire hazards are reduced; maintenance is lessened; total energy consumption and power demand are lowered.

I-T-E is eager to help in any effort to produce more coal. Our factory, busy as it is in these days, has capacity for prompt action in meeting the demands of the vital mining industry.



Type KSC Automatic Reclosing Circuit Breaker

I-T-E

Representatives in Principal Mining Areas

CIRCUIT BREAKER CO.

PHILADELPHIA, PA.

CARDOX

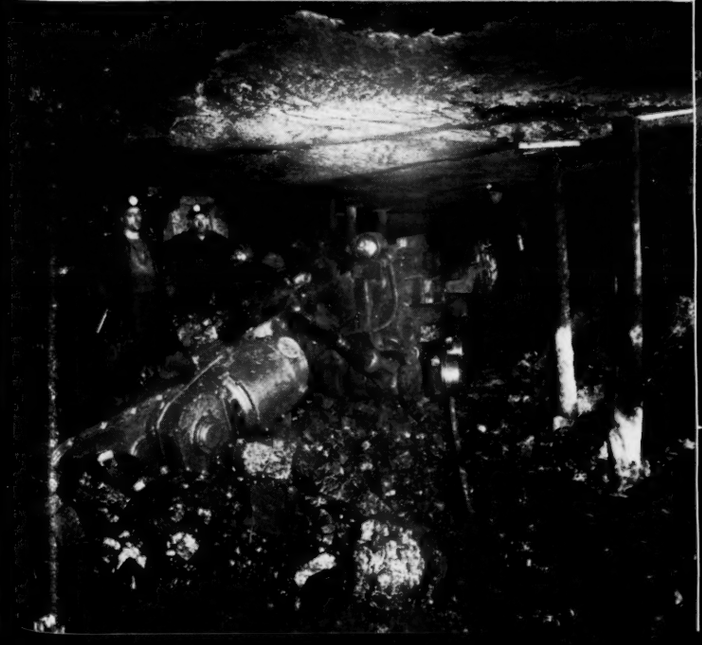
THE NON-EXPLOSIVE MINING METHOD

MAKES THE MOST OF AVAILABLE MACHINES AND MANPOWER

Foremost among the problems faced by most mines today is to step up production in the face of a decrease of experienced manpower . . . and difficulty in getting delivery of new equipment.

CARDOX helps solve these problems . . . quickly . . . economically. It steps up the output of available cutters because longer cutter bars can be used . . . providing more coal per face for the loaders. It enables existing loading machines to work faster . . . with less time out for maintenance and repairs . . . because its slow, heaving action rolls the coal forward in a loose pile.

A test demonstration in your own mine will prove the value of CARDOX in mobilizing for all-out war effort by stepping up production efficiency, permitting better supervision and making possible greater final recovery.



CARDOX CORPORATION

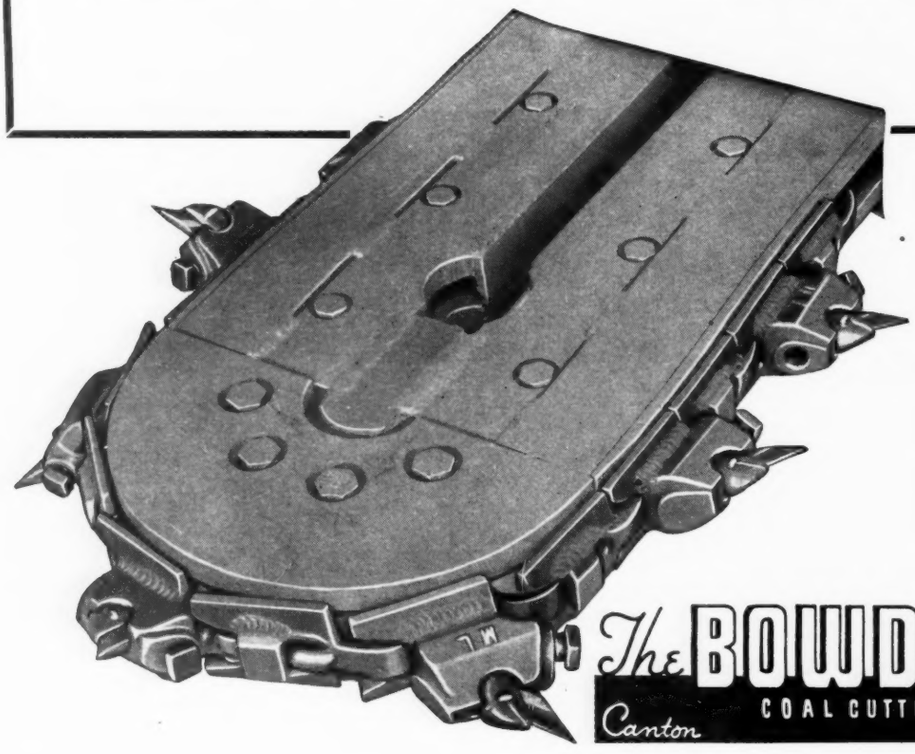
BELL BUILDING • CHICAGO

GENERAL JIM SLIM SAYS:

"AN ARMY OF BOWDIL CONCAVE CUTTER BITS CAN ROUT EXCESSIVE COAL CUTTING COSTS"

BOWDIL CONCAVE CUTTER BITS, in service on the mining front, are daily demonstrating that they can defeat excessive coal cutting costs . . . . to give you a most important saving on this most important operation. Tests have proved that these BOWDIL bits not only give 15% to 20% longer service life and consequent power savings, but one of our customers recently stated that "If you want proved testimony for your concave bit, we are now cutting three to five times more places with a set of bits than we did with the regular bit, and we are getting 25% to 30% more coarse cuttings". Mainly, it's the design and construction of the bits that gives results like this . . . . the steel bars are rolled with concave faces, which gives the finished bit ample clearance, allows it to be worn down 25% farther than standard bits without increasing power demand or dust.

Use these bits in combination with the BOWDIL CUTTER BAR—newly designed for greater strength—and the BOWDIL CUTTER CHAIN . . . . then you'll have a coal cutting team that will practically assure greater volume coal cutting at a lower rate per ton.



LET US HELP YOU SOLVE YOUR COAL CUTTING PROBLEMS . . . WRITE, WIRE OR PHONE

The BOWDIL Company
Canton COAL CUTTING EQUIPMENT Ohio

The Westinghouse Rototrol consists of a regulating generator with special windings designed to fit into the control scheme of which it becomes a part. It can be used as a power amplifier, as a speed regulator, as a current limiter, and as an automatic acceleration-deceleration control.

ROTOTROL

STARTS IT—STOPS IT

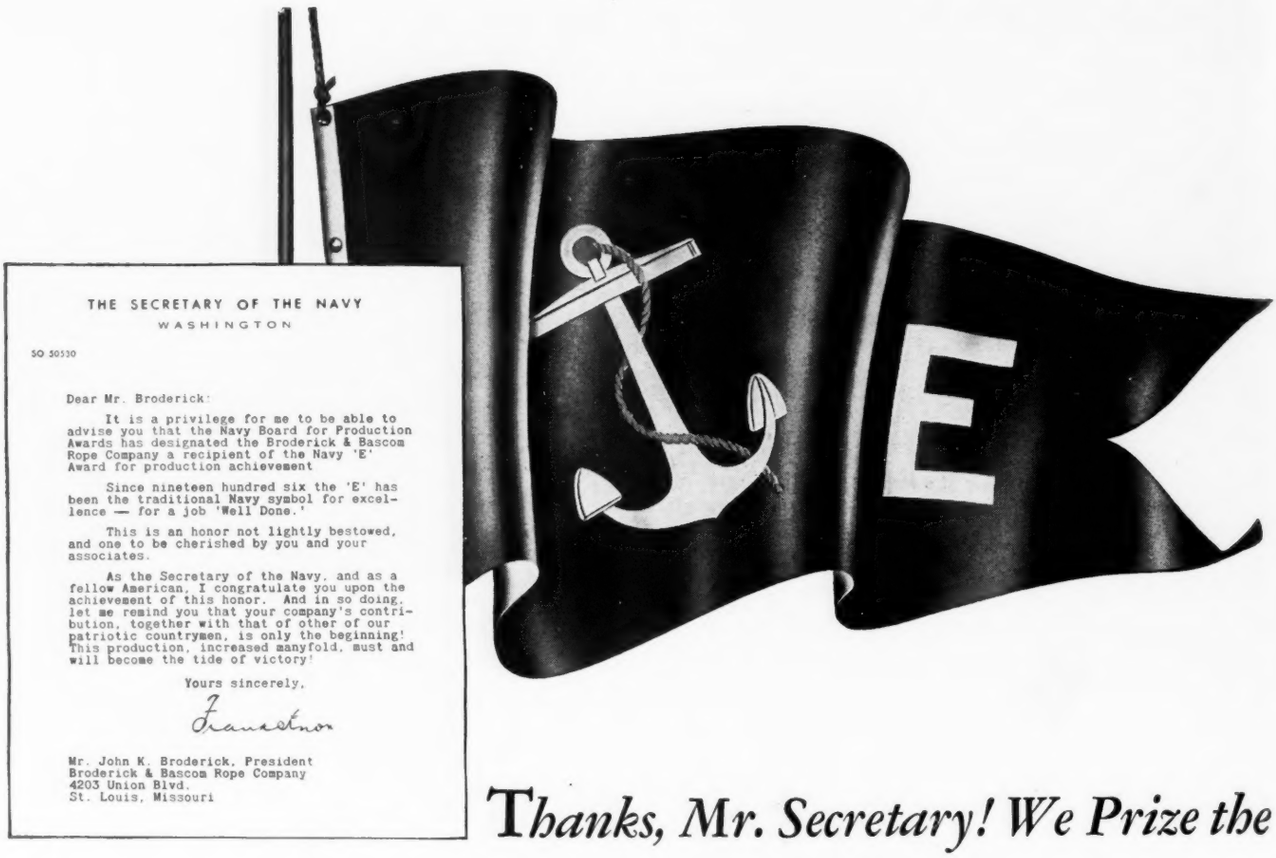
SWINGS IT *Smoothly*

This 33-yard electric shovel turns and returns without a jar or a jolt

There are no sudden jerks when this mammoth Bucyrus-Erie shovel turns to drop its 33-yard mouthful of overburden at the Flamingo Mine. With Rototrol, the Westinghouse automatic acceleration and deceleration control, the huge dipper together with its cab and boom all are swung quickly to any position, brought to a smooth stop. This smooth operation reduces stress on pinions and strain on the front end. Production time valued up to $300 an hour is saved by minimizing replacement costs and maintenance expense.

Rototrol is another typical example of how Westinghouse is constantly improving electrical equipment for the mining industry . . . not only for strip mining, but underground mining as well. Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa., Dept. 7-N.

Westinghouse



THE SECRETARY OF THE NAVY
WASHINGTON

SO 30530

Dear Mr. Broderick:

It is a privilege for me to be able to advise you that the Navy Board for Production Awards has designated the Broderick & Bascom Rope Company a recipient of the Navy 'E' Award for production achievement

Since nineteen hundred six the 'E' has been the traditional Navy symbol for excellence — for a job 'Well Done.'

This is an honor not lightly bestowed, and one to be cherished by you and your associates.

As the Secretary of the Navy, and as a fellow American, I congratulate you upon the achievement of this honor. And in so doing, let me remind you that your company's contribution, together with that of other of our patriotic countrymen, is only the beginning! This production, increased manyfold, must and will become the tide of victory!

Yours sincerely,

Frank Knox

Mr. John K. Broderick, President
Broderick & Bascom Rope Company
4203 Union Blvd.
St. Louis, Missouri

Thanks, Mr. Secretary! We Prize the

NAVY "E" AWARD *for Excellence*

...and We Rededicate Ourselves to the Service of America

In a recent message, the Secretary of the Navy informed the Broderick & Bascom Rope Co. of its selection to receive the coveted Navy "E" Award. This honor—symbolized by the Navy "E" burgee, a pennant bearing the anchor and "E"—is official recognition of outstanding performance in production.

To Navy men and their ships, since 1906, the letter "E" has literally stood for "Excellence" in a task assigned; winning it has been a much-sought mark of distinction. Now bestowed upon industry for special achievement in serving the Navy, the "E" is properly shared by the plant and all its employees. The new Navy "E" pennant flies near our American Flag, and individual employees proudly wear "E" lapel buttons.

In acknowledging this award, with deepest thanks, the Broderick & Bascom Rope Co. appreciates that it carries the obligation to surpass past records today and in the future. Through times of peace and war, since 1876, we have given our best to the manufacture of wire rope for the nation and its industries. At this new milestone we again dedicate our full energies and resources to the cause for which America fights and the Victory that will be won.

Broderick & Bascom Rope Co., St. Louis

Manufacturers of Yellow Strand Preformed Wire Rope

Branches: New York, Chicago, Houston, Portland, Seattle • *Factories:* St. Louis, Seattle, Peoria

Have you tried Scully?

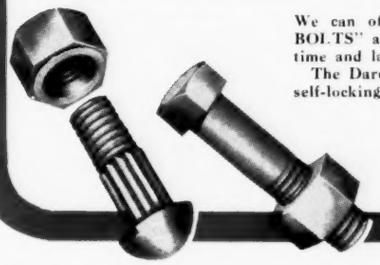
WE are not magicians, but we will do everything within our power to help you get the materials you need. We have stocks of many steels on hand, also tools, machinery and other equipment.

Be sure to try Scully — see our phone numbers below. Cut out the number of the warehouse nearest you and paste it in a handy spot.

Structural material
Plates, various qualities
Floor Plates
Sheets: Hot Rolled, Cold Rolled, Galvanized, etc.
Bars (all shapes): Hot Rolled Carbon and Alloy grades
Hot Rolled Strip Steel
Spring Steel · Tool Steel
Drill Rod
Cold Finished Bars, Carbon and Alloy grades
Wire
COR-TEN and MAN-TEN Shapes, Sheets and Plates
Abrasion-Resisting Sheets and Plates
Eaves Trough, Conductor Pipe
U·S·S Stainless Steel and Stainless products
Expanded Metal
Rails
Boiler Tubes
Rivets, Bolts, Nuts, Washers
Dardelet Rivet and Machine Bolts
Nails
Welders and Welding Accessories
Chain
Clamps
Flanges
Expanders, etc.
Hoists, Shears, Rolls, Punches, Cut-Off Machines, Saws, Nibblers, etc.

CHICAGO	**BRUnswick 2000**
Teletype CG. 605	
BALTIMORE	**GILmore 3100**
Teletype BA. 63	
BOSTON	**STAdium 9400**
CLEVELAND	**HEnderson 5750**
Teletype CV. 153	
PITTSBURGH	**CEdar 7780**
Teletype PG. 475	
ST. LOUIS	**MAin 5235**
MINNEAPOLIS - ST. PAUL	**NEstor 2821**
NEWARK, N. J.	**BIgelow 3-5920**
	BErgen 3-1614 - REctor 2-6560

IN STOCK! DARDELET "RIVET-BOLTS"



We can offer immediate shipment of both Dardelet "RIVET-BOLTS" and Dardelet Machine Bolts. These bolts save valuable time and labor and assure permanently tight joints.

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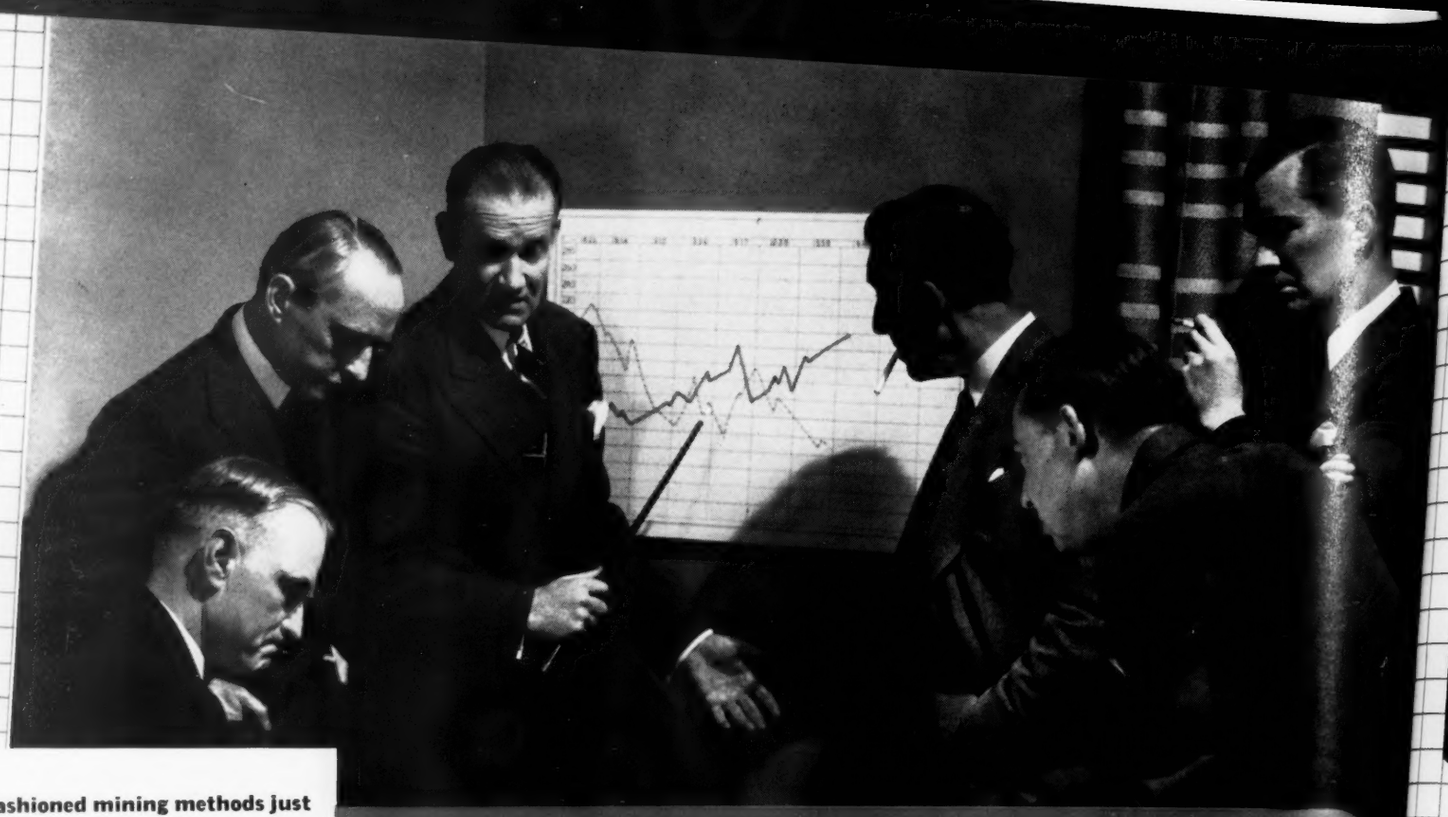

Old fashioned mining methods just can't compete costwise or tonnage-wise with modern mechanized equipment.

KEEP THAT TONNAGE CURVE UP

The answer, as production executives the nation over can testify, to increased tonnage and lowered costs—is Joy Mechanized Equipment—fast, dependable loaders—quick time-saving shuttle cars. See a Joy Engineer for detailed information.

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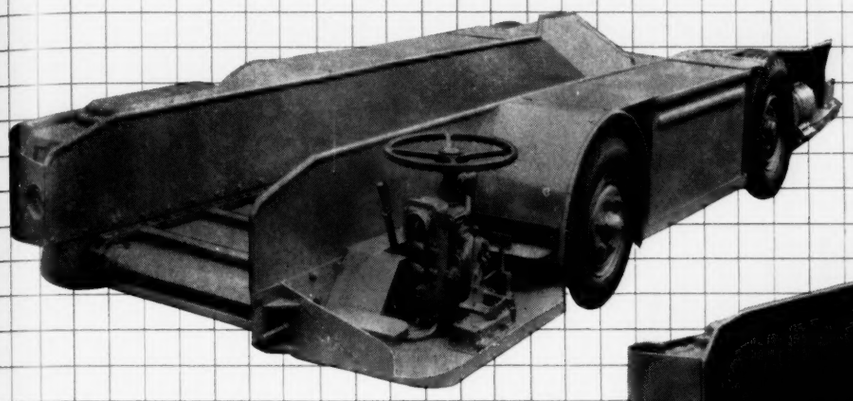
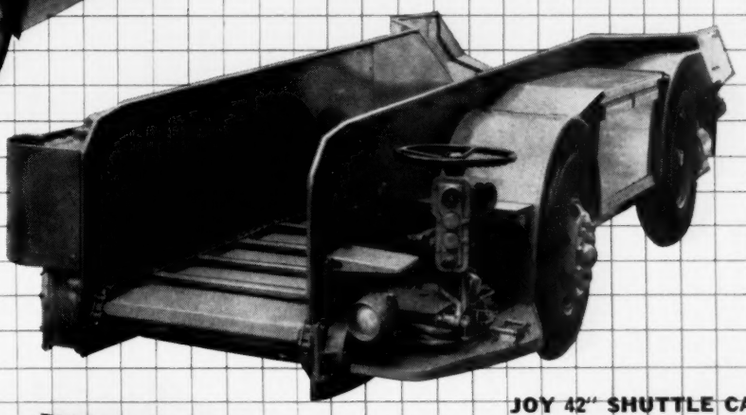


JOY 32" SHUTTLE CAR
3½ ton capacity for low seam operations.



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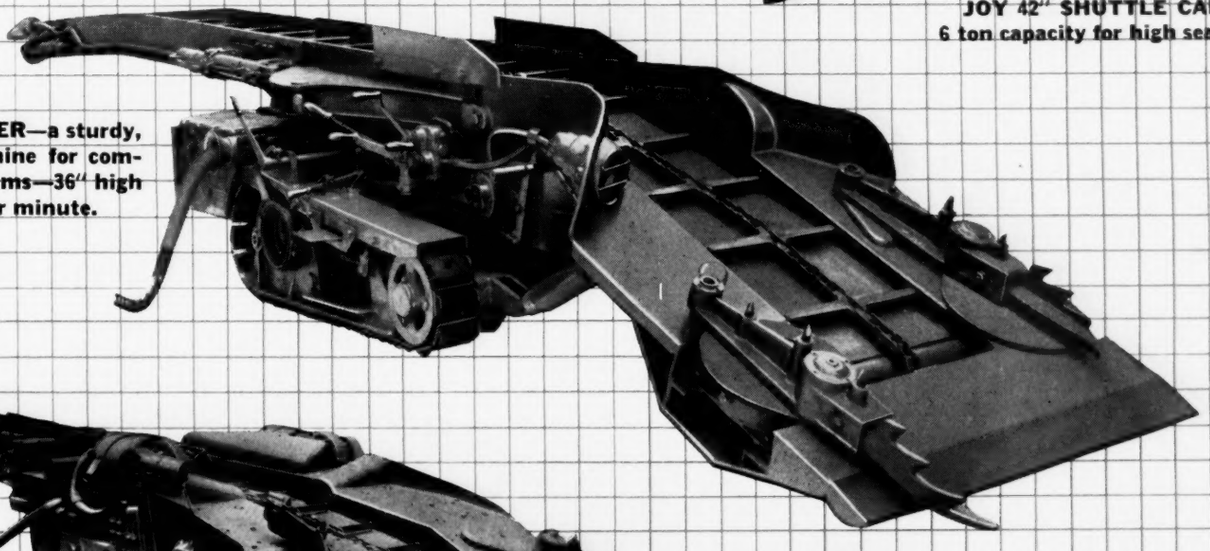

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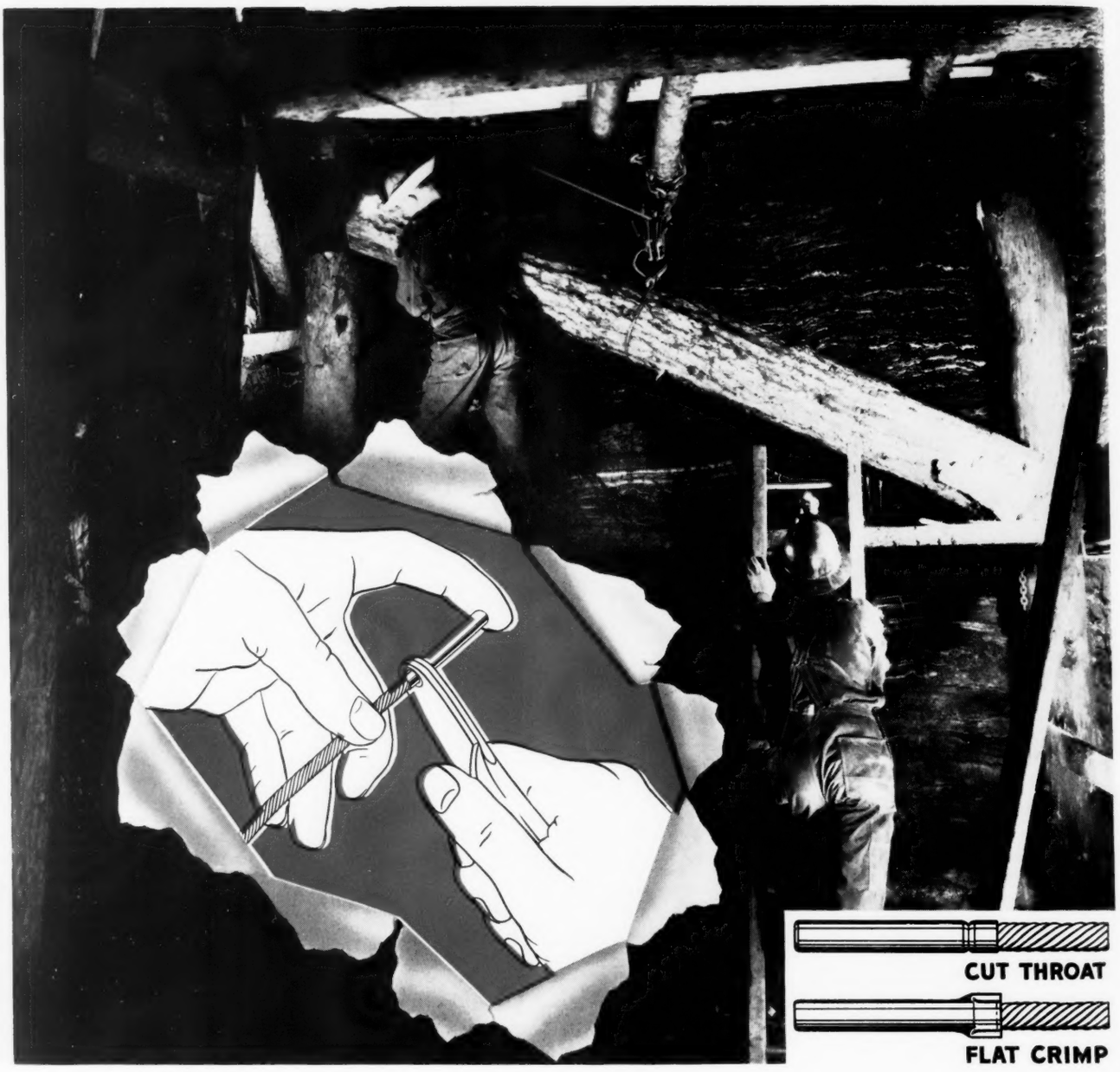

Photograph taken in an iron mine

Crimp—with a Crimper

The bond between detonating cap and fuse should be tight, positive, secure. This is doubly important in wet work. See that the fuse is cut square and clean. Seat it firmly against the charge in the cap—then crimp. You can use a flat or a "cut throat" crimp, as preferred, but in either case, be sure of a joint that's snug-fitting, strong, permanent.

For better results in blasting, use Ensign-Bickford Safety Fuse. There's a brand designed to meet the conditions in your mine.

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ENSIGN-BICKFORD SAFETY FUSE

Coal Age *Editors look at the News*

★

East's Fuel Oil Deliveries Halved, WPB Points Switch to Coal

OVERSHADOWED only by gasoline rationing was another development in the petroleum industry over the week-end of May 16. On that date the War Production Board, in amending Limitation Order L-56, cut deliveries of light fuel oil—used largely for heating homes—to dealers 50 percent below last year in the 17 Atlantic Seaboard states. At the same time, deliveries of such oil for use in the operation of coal-spraying equipment were forbidden anywhere in the United States (details of the order are given on a later page under "Other News From the Field").

In urging all domestic fuel-oil consumers to shift to coal at once, Deputy Petroleum Coordinator Ralph K. Davies stated that conversions already were saving heavy (industrial) fuel oils at the rate of over 10,000,000 bbl. annually and that he expects the figure to be almost doubled. Drives are afoot to bring similar changeovers to thousands of home basements before next winter.

A temporary difficulty was WPB's Order L-79, which on April 16 froze all plumbing and heating equipment. The order has been relaxed, however, permitting the sale of cooking and heating stoves and water heaters where no other equipment for these purposes is available. The amendment also permits sale and delivery of any equipment required to convert oil and gas burning equipment to the use of coal. Limitation Orders L-74 (oil burners) and L-75 (coal stokers) eliminated manufacture of all new equipment.

Excellent assistance in furthering the switch back to coal has been given by Anthracite Industries, which last year began a study of the conversion problem. Its outstanding feat is a plan for restoring coal fuel to home furnaces which changed to oil in past years.

A.I. found that about 1,250,000 oil burners in eastern seaboard homes, almost 60 percent of the national total. Many grates and doors were uncovered that had been taken off when the oil burner was put in, but often the junk man already had collected such items for war scrap. Out of the 1,250,000 burners it was estimated 380,000 had grates on hand, that for 335,000 grates could be ordered, that 140,000 would require entire new boilers, and that 395,000 would have to have special round or triangular grates.

For the furnaces needing special grates Anthracite Industries Laboratory developed special replacement grates. The round ones are complete suspension and shaker units and come in 19- to 25-in. diameters. The rectangular grates come in adjustable sizes up to 25½x50 in.; main parts are a cast-iron bar that can be cut to the desired length and notched keys which slide along the bars to provide grate surface.

Aluminum master patterns for the grates have been placed with these large anthracite distributors: D. L. & W. Coal Co., Hudson Coal Co. and the Lehigh Navigation Coal Co., as well as the Hershey Machine & Foundry Co. These companies will furnish dealers with the grates, the coal companies producing them. In this way, Anthracite Industries estimates that it can replace 80 to 90 percent of all threatened oil burners. In addition to taking care of non-standard grates the organization has listed for dealers all current types and manufacturers who can supply them.

Checking supply and storage possibilities, investigators found that all houses either had windows capable of accommodating a coal chute or a door through which coal could be carried. But only 33 out of each 100 basements had coal bins intact. In all, but 4 percent had available space in which coal bins could be built. The remainder represent instances where bins would encroach upon finished space or living quarters, which furnished a clue to the number of basements that have been redesigned as playrooms or equipped as home rathskellers.

It is hoped that conversion can be accomplished gradually, not saved for a wild rush when next autumn brings a foretaste of winter.

Hatchet Buried

This drastic cut in oil deliveries in the areas of its heaviest use is eloquent evidence of the mounting destruction of tankers in the U-boat drive, as a consequence of which home use of oil must give way to industrial needs.

Competition between those ancient rivals oil and coal burners is out until the Axis has been disposed of, cooperation to that end being the chief business in hand. Though they have buried the hatchet, however, its resting place has been carefully marked, and it will be wielded with renewed fury as soon as the firing ceases. In the circumstances, the importance to the coal industry of rebuilding its fences and defenses for the post-war scramble for business scarcely needs emphasis.

Nor are manufacturers of chemical agents for allaying coal dust likely to shed many tears—except of the crocodile variety—over the

predicament of makers of oil sprays. What use the chemical-preparation producers will make of the opportunity dropped in their laps remains to be seen — especially after the smoke of battle clears.

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Stock Coal Now, Nelson Warns, To Avert Rationing Later

CONSUMERS of coal, especially industrial users and war plants, were urged by Donald M. Nelson, chairman of the War Production Board, on May 11 to stockpile coal at once to the limit of storage capacity. The appeal was made in an open letter in which it was pointed out that transportation difficulties will increase in future months, but that there is still some available carrying capacity on railroads and other transportation facilities which can be used now to transport coal. The letter carried a warning that serious transportation difficulties will occur in the coming fall and winter months unless the stockpiling of coal is started at once and carried on effectively.

Mr. Nelson's letter reads as follows:

"As chairman of the War Production Board, I am urging all consumers of coal, especially large industrial users and war plants, to begin stockpiling coal at once and to increase inventories of this fuel to the limit of storage capacity.

"Transportation difficulties will increase in future months, but the railroads and other transportation facilities still have some surplus carrying capacity which must be utilized now in order to avoid serious transportation dislocations next fall and winter.

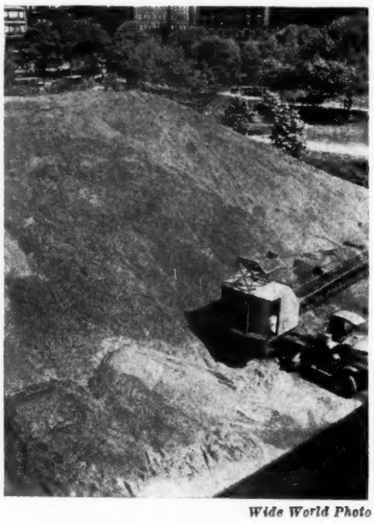
"Moreover, the fuel-oil situation on the East Coast and winter weather transportation problems make stockpiling operations now of great importance to all consumers who are now dependent or who may later on become dependent on coal for heating their homes or running their plants and factories.

"In addition to transportation problems it is obvious that we shall consume much more coal than we do ordinarily. All these factors add up to the fact that we can meet all demands and keep our operations running smoothly only if we plan the mining and transportation of coal during the year so that steady maximum use is made of our production and transportation facilities.

"If this is not done, there will undoubtedly be serious transportation problems, probably involving emergency rationing, which might otherwise be avoided.

"So far as dealers are concerned in the retail field, if they require financial help in building up coal stocks, and if they purchase coal for shipment from the mines before Aug. 1, 1942, they may apply for loans direct to the Reconstruction Finance Corporation or through their local banks.

"Complete cooperation with this program will help the nation avert serious problems. We must stockpile coal to the limit. I know I can depend on your help."



Wide World Photo

Museum Stores Coal For Next Winter

Not pretty but patriotic is this mountain of coal rising on the grounds of the American Museum of Natural History, New York City. The steam shovel is adding to the pile, which eventually will contain 11,000 tons, enough for a year's supply at the museum. The coal is being delivered and stored now in order to ease the transportation problem next winter.

Warning in the same vein was voiced by Howard A. Gray, Acting Director of Solid Fuels Coordination, in an address before the Fuels and Metals Group of the 30th annual meeting of the Chamber of Commerce of the United States, April 28, in Chicago. "The coal problem, serious as it is," said Mr. Gray, "has a relatively simple remedy. We must spread production and transportation of the year's supply more evenly over the twelve months. This can be accomplished only by purchasing coal now and storing it for future needs. That would relieve the seasonal peak pressure on mines and carriers and make it less likely that shortages would result from overtaxed facilities. A full coal bin is the best possible insurance anybody can have against a war-time coal shortage.

"The war is handicapping both the production and transportation of coal. In production, mine operators are confronted with reduced labor supply and shortages of such materials as steel, copper and rubber, which are used in large quantities by the mining industry. In the transportation of coal, which appears to present the more pressing problem now, we are confronted by the possibility that the nation's carriers will be unable to meet peak demands this fall and winter."

Buttressing these appeals was a statement by Joseph B. Eastman, Director of Defense Transportation, that 350,000 tons of bituminous coal must be moved each week for the remainder of the year if a shortage in the Northeastern States is to be avoided.

Luther Harr, Bituminous Coal Consumers' Counsel, cautioned consumers on May 12 that Mr. Nelson's warning of coal rationing was no idle threat. Mr. Harr especially urged home owners in the Midwest and West to increase their participation in the "Buy Coal Now" drive. As more than 50 percent of all the power used in America is generated by coal, said Mr. Harr, production will be crippled and we will be in

grave danger of losing the war if industry does not get coal. Therefore, he added, Mr. Nelson will see that industry gets coal even if home owners have to do without. "For many communities the choice is: buy now or go without next winter."

Speaking May 13 at the eleventh annual convention of the Ohio Coal Conference, Inc., at the Hotel Gibson, Cincinnati, Thomas J. Thomas, Associate Director in charge of Bituminous Coal, Office of Solid Fuels Coordination, said: "To protect themselves against possible shortages and to help reduce the fall peak in fuel demands to a size that will not present difficulties for the carriers to meet it is necessary for dealers and consumers to order their coal now and place it in storage this spring and summer. This not only would be wise action but it is the patriotic duty of every person who can do so. This will help to clear the rails for the movements of soldiers and arms, and make available more transportation facilities with which to move the raw materials required in fabricating planes, tanks, ships and guns. . . . The government may be forced to institute an emergency distribution plan if a serious coal shortage should occur, but this will be done only as a last resort measure."

Midwest industrial and domestic consumers were advised on May 7 by Dr. Walter Dill Scott, chairman of the Solid Fuels Advisory War Council, to abandon hand-to-mouth fuel buying and stock coal this spring and summer in anticipation of possible transportation limitation this fall and winter. The statement was authorized by the War Council on winding up its third session in Washington since organization.

Start Now!

Not only do these remarks bear out the wisdom of the "Buy Coal Now" campaign but they emphasize the utter foolhardiness of any other policy, beginning immediately. It is gratifying to note, however, that public response to such appeals is gaining headway. Mr. Harr reports that there has been a marked increase in coal car loadings in recent weeks as compared with early April, "indicating nearly 100-percent utilization of coal-carrying facilities." It will be necessary nevertheless that the campaign continue without abatement until all possible steps to assure an adequate domestic supply of coal for next winter have been taken.

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Maximum Coal Prices Set By Henderson Office

Maximum Price Regulation No. 120, covering bituminous coal delivered from mine or preparation plant, effective May 18, was released April 28 by the Office of Price Administration, Leon Henderson, Administrator. The maximum prices are set forth in 22 appendices (A to V), covering specifically mine operations in the 22 production districts set up under the Bituminous Coal Act of 1937 and under which producers are observing minimum prices established by the Bituminous Coal Division.

The new regulation "incorporates general upward adjustments which are added to the average October, 1941, prices for all bituminous coals. It was deemed appropriate in the bituminous coal industry, taking into account necessary production, to establish maximum prices at levels sufficiently high to return actual October, 1941, prices, plus post-October increases in cost of operation up to the present time, to the predominant tonnage of the various sizes and kinds of coal, rather than merely to the substantially lesser tonnage which would have been embraced by the arbitrary application of average October prices."

Maximum Price Regulation No. 122, applying to wholesale and retail prices of solid fuels, including anthracite, semi-anthracite, bituminous, semi-bituminous, subbituminous and cannel coal, lignite and coke, also was issued April 29 and took effect on May 18. It provides that the maximum price charged by a person subject to the regulation "shall be the highest price advertised by the same person between Oct. 1 and Dec. 31, 1941."

Amendment No. 1 to Maximum Price Regulation No. 122 was announced May 16, to become effective simultaneously with the regulation, May 18. The regulation stipulates that dealers shall allow deductions from their price of cash and quantity discounts which were permitted during any part of the Dec. 15–31, 1941, period; the amendment provides that charges for special services shall not exceed those for similar services during the same period.

Amendment No. 2, effective May 22, redesignates paragraph (e) of Sec. 1340.261 as paragraph (e) (1) and adds paragraph (2) regulating lake dock sales.

Price Regulation No. 121, released April 28, covers miscellaneous solid fuels delivered from producing facilities—that is anthracite other than that produced in Pennsylvania, semi-anthracite, lignite, coke (with certain exceptions), briquets and sea coal.

Price Regulation

Price regulation, long threatened, has come at last as part of a general plan meted out to all industry and not as an invidious distinction of the coal industry. Coal men will accept it loyally. Its imposition will prevent the entire industry from being blackened by the greed and lack of patriotism of a very few, should conditions later make it easy to obtain any unreasonable price the few may see fit to ask. Now we have a price ceiling, shall we have to test the roof every so often to assure ourselves it is not about to come down?

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Draft to Defer Coal Men In Critical Jobs

Workers in critical occupations in the coal and railroad industries may be deferred from military service on occupational grounds, according to a ruling on May 6 by Maj. Gen. Lewis B. Hershey, Selective Service Director. He emphasized, however, that the deferments must be decided individually by local draft boards of the men in question, after all facts have been examined. The Selective Service Act does not permit group or class deferments.

In a memorandum to State Selective Service directors, General Hershey listed 62 occupations in coal production to which the new ruling applies. Describing the coal and railroad industries as vital to success of the war effort, he said:

"These critical occupations are such that, unless they are filled by men with the required degree of training, qualification or skill, a serious loss of effectiveness in the activities of these industries will result. Because of the essential character of training necessary to qualify persons to replace those in these occupations, local boards should consider the estimated period of training or experience required for each occupation."

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Group Outlines Ways to Rehabilitate Condition of Anthracite Region

Two classes of improvement, one for immediate and one for long-term reconstruction, are suggested by the Federal Anthracite Coal Commission in a report to the President, the House of Representatives and the Senate, April 2, on "Economic Conditions in Anthracite Coal Regions," House Document No. 709. The inquiry leading to the report was made pursuant to Public Law No. 355 (House Joint Resolution No. 255). The late Patrick J. Boland was chairman and R. R. Sayers, secretary.

In regard to immediate improvement, the report urges that the war agencies of the Federal Government, seeing that the area is 100 to 150 miles from the Atlantic seaboard and "well protected by mountains," give careful consideration to the suitability of the area for the location of necessary war plants, particularly those for the production of aluminum, zinc, synthetic ammonia, explosives, castings, forgings, armor plate, machine parts, aircraft parts, tank parts and ammunition.

Comprehensive surveys of mine flooding, plans for drainage tunnels and prevention of water inflow, it adds, should be pressed to completion, but, wherever possible, the work should not be delayed awaiting the publication of the final report of the Susquehanna Drainage Basin Committee. Anthracite producers should make further investigation into the development of stokers that will make anthracite as convenient for use as oil and enable it to relieve coke and oil shortages.

As for long-term improvements, an anthracite mines research station of the U. S. Bureau of Mines should be located in the anthracite area to seek new outlets for anthracite, to study mining methods, to survey mine-water problems, to aid in improving the health conditions in the mines and to help solve mine-water-acidity and silt problems. Means of raising the production per man-day, by application of the most modern and efficient methods, should be studied by federal and State agencies and an analysis made for revision of royalties, local taxes and anthracite prices. Support should be given to expedite the work of the Allegheny Forest Experiment Station so that a vigorous program of reforestation may be gotten under way.

Objections to the anthracite region as a location for war industries as voiced by others and quoted by the report are: (1) location not as far from the coast as areas in the inland defense zone; (2) absence of sites large enough for the location of an important industry; (3) areas already or likely to be undermined, thus jeopardizing factory construction; (4) sites subject to flooding; (5) acidity of water; (6) vulnerability to aerial attack of dams needed for the impounding of essential water supplies; (7) untrained and unadaptable labor, inexperienced management and distance from home office. The report states that some of the lowest fuel costs in the East for power generation can be found at the mouths of the mines in the anthracite area, and that the forests in 15 counties centering around the anthracite region provide 90 percent of all the timber used in mining as well as wood for many other uses.

Somewhat Misleading

No one can question that the anthracite region is less exposed to bombing than Bridgeport, Philadelphia, Baltimore and Washington. Other places close to the anthracite region, as given in the foregoing report—namely, Berwick, Harrisburg, Williamsport and Pottstown—are centers for war-work activity. The anthracite region has vacant housing and idle men who would be available for manning war industries. The nine objections raised to the anthracite region and quoted by the commission omit three difficulties that are generally advanced, rightly or wrongly, as reasons for the decline in all industry in that area: high wages, disposition of the men to quit work early, and intense union activity resulting in strikes and opposition to mechanization.

One would suppose, reading the report, that the coal companies had done nothing to develop stokers and promote their use. Without saying anything discourteous or untrue, the report does its deadly best to suggest that the operators have been derelict in this regard and in the investigation of possibilities of expanding industrial uses for anthracite, as also in preparation for the displacement of coke and oil by anthracite.

All these things the anthracite industry has been doing for a longer or shorter period and to say that it is squarely up to them without saying how devotedly they have undertaken it shows a disposition to seek credit for a third person's labors.

The report declares that "after the war there probably will be indirect competition with this fuel [anthracite] as well as with some grades of bituminous coal." To this exception might well be taken; all the coke-oven installational activity during the war has been in the bituminous region that for years has not used anthracite, hence it is likely that the anthracite region will not suffer from this construction work, unless it should develop larger metallurgical uses for anthracite than it recently has enjoyed.

War-Conscious Coal Congress Attacks Operating Problems at Cincinnati

WITH a program thrice revised to reflect the impact of the war on America's coal-production problems, the Nineteenth Annual Coal-Mining Convention of the American Mining Congress met in the Netherland Plaza Hotel, Cincinnati, Ohio, April 27–28. In two meetings, two luncheons and the banquet, spokesmen from Washington discussed war problems, and at the opening session, members of the Congress expatiated on similar matters. Safety and coal preparation each had a session and mechanical handling of coal underground and strip mining had like consideration.

Opening the convention, Julian D. Conover, secretary, said that the mining industry is ready to make every sacrifice that will assure victory, for without it no satisfactory post-war arrangement is possible.

The coal industry, declared J. Noble Snider, vice president, Consolidation Coal Co., and national chairman, program committee, is on the threshold of the most important period of its history. Prior to Pearl Harbor, business as usual was the watchword, but today the desire to produce is the spirit which animates all operation. Production departments today cannot supply the tonnage which the business departments can sell.

The coal industry, reflected Harry M. Moses, president, H. C. Frick Coke Co., chairman of the Coal Division, American Mining Congress, has had such a difficult time of recent years that it has had no opportunity to become "soft" and is ready for a tough assignment such as the war presents. At no time in its history, asserted E. J. Burnell, vice president, Link-Belt Co., and chairman, Manufacturers' Division, has the nation been as dependent on coal as at present. The industry must turn its withering heat on the enemies of democracy.

Must Guard Against Sabotage—Quinn Tamm, chief, Identification Division, Federal Bureau of Investigation, Washington, D. C., said that the FBI force had expanded from 900 to over 3,000 men. Long before the Pearl Harbor attack, the machinery of the FBI was ready to act the moment the Axis nations saw fit to include us among their active enemies. About 68,000 reports of espionage and sabotage have been investigated.

Nearly 600,000,000 Tons of Coal Will Be Needed—Fifty-two percent of the nation's energy is derived from coal, asserted T. J. Thomas, associate director, in charge of bituminous coal, Office of Solid-Fuels Coordinator, Washington, D. C., at the luncheon of April 27, with Charles Dorrance, president, West Virginia Coal & Coke Corporation, Cincinnati, Ohio, in the chair. Many believe, Mr. Thomas added, that before the war is over that figure will be 60 percent.

The coal industry, said R. Livingston Ireland Jr., president, Hanna Coal Co., Cleveland, Ohio, must try to make the Selective Service Division realize the supreme importance to the war effort of not depleting the mine forces. The mines also must try to use men not subject to draft. It must be explained to the draft authorities that the certificate law acts as a dam to prevent recruiting of new men for the mines.

Coal Is Defense—Mining and munitions should have the same standing in regard to priorities, asserted Wilbur A. Nelson, Administrator of Mining Branch, War Production Board, speaking at the luncheon on April 28, with J. W. Haddock, vice president, Sullivan Machinery Co., as toastmaster. Gold and silver mining, however, are exceptions. Substitutions should be made where possible. One mine uses coat hangers for welding wire.

At the banquet, Admiral Thomas C. Hart, U. S. Navy, spoke on the situation in the Far Eastern theater of war with Harry M. Moses in the chair. Meetings were arranged between Mr. Nelson and company purchasing agents on Tuesday morning and with the manufacturers in the afternoon of the same day. At the meeting of the Manufacturers' Division Mr. Haddock was elected chairman; George E. Stringfellow, vice president, Thomas A. Edison Co., Inc., was advanced to first vice chairman, and H. V. Brown, president, Brown-Fayro Co., to second vice chairman. Probably 650 to 700 were in attendance at the meetings. Recorded attendance was 326 operators representing 173 companies and 281 manufacturers representing 93 companies.

Ten to fifteen million tons more iron will be needed in 1942 than in 1941, foreshadowed R. E. Snoberger, salvage director, Coal Mining Industry, APB, at one of the Tuesday afternoon sessions, or 14,000,000 more than any year prior to 1941. Simplification and substitution must be used to reduce the quantity of metals needed.

Impact of War on Mining

Defense and Draft Reduce Working Force—A questionnaire submitted to the six largest operating companies in the anthracite region disclosed that, prior to Feb. 1, 1942, the armed forces had absorbed 1,405 men and defense plants 2,860, said W. B. Geise, in charge of labor relations, Susquehanna Collieries Co., Nanticoke, Pa. A number of the latter group went to local factories but others moved their families out of the State, the largest numbers going to Connecticut and Maryland. Probably of the 89,000 employees in the entire anthracite industry, about 2,500 men entered the armed forces and 4,500 were absorbed by defense plants.

One company, which had conducted training classes in shop work, lost to the defense industries 300 men who had received this instruction. Mr. Geise predicted that a definite shortage of miners and other skilled workmen will be ex-

perienced in the northern anthracite field in the current year, with an acute shortage during 1943.

Sniping Miners—In northern West Virginia, declared Joseph Pursglove Jr., general manager, Pursglove Coal Mining Co., Pursglove, W. Va., the company's two mines employ about 850 men and produce 6,500 tons daily. At his mine, 80 men left in March, only 10 to the draft, 10 to defense industries, but 60 to other mines. The real interference with production in West Virginia is not the draft or defense but raids on mine labor made by neighboring mines. The mines are working on double or triple shift, and if a man is not put on the day shift, he is fair game for a superintendent or a foreman of another company who can find or make a vacancy on his day-shift force.

A waiting list of applicants for work equal to 25 percent of those now employed was reported by Evan Evans, general manager, Lehigh Navigation Coal Co., Inc., Lansford, Pa. Only 25 percent of the men now employed are less than 35 years of age. His company's mine force is, therefore, far more stable than those reported at other operations. The mines worked less than 200 days and could work 272. So production could be "stepped up" 40 percent. He presumed that other anthracite companies could do likewise.

Substitutes to Win War

Welding Makes Even Scrap Available—Today, interruptions due to breakdowns simply are not tolerated; they waste time; so repairs are made before breakdowns can occur that will make extensive repairs necessary. This was the keynote of the remarks of Edgar Schweitzer, assistant mechanical and fuel engineer, Lehigh Valley Coal Co., Wilkes-Barre, Pa., at the Loading and Conveying Session, on the afternoon of April 27, at which Charles W. Conner, general superintendent, American Rolling Mill Co., Nellis, W. Va., presided.

Flats on mine-car wheels are now reconditioned by welding. A new wheel has a life of 117 working days; the same wheel, welded once, of 108 days; welded twice, of 80 days, and welded a third time, of only 59 days. From experience gained, the accepted practice now is to place two new wheels with two welded wheels on the same car; thus obtaining practically the life of new wheels. Balancing a cost of welded wheels at $1.80 per pair against a new-wheel cost of about $6.75 per pair after scrap allowance, the saving is obvious.

Grooved locomotive tires of both steam and electric locomotives have been rebuilt with some success. Today, welders are filling the grooves in worn slope rollers, and repairing sprocket wheels, teeth of roll segments, gears and pinions and rail frogs (these without removal from road). They have made good locomotive-boiler tubes from two defective ones, repaired broken engine frames, as also breaks in cast-iron pipe and its fittings, connected pipes without using fittings, restored worn-out pedestals and made many similar repairs. On small acetylene repair jobs, steel wire has been used in place of welding rod.

To prolong the life of equipment and make purchases of new material unnecessary, bushings have been shrunk on worn car axles and armature shafts; rusted or damaged pipe has been cut and threaded; bronze pump parts have been made from scrap piston rods, studs, etc.; bushings have been lined for longer life and traction sprocket and gear wheels have been drilled and rebushed.

J. W. Haddock

Vice president, Sullivan Machinery Co.; chairman, Manufacturers' Division, American Mining Congress, 1942–1943.

Samples of Welding Jobs—Steam and electric locomotives have been completely rebuilt; magnet frames or motor casings for electric locomotives, when worn loose, have been built up by electric welding with a rod of tough wearing steel, and then machined and fitted with new unbreakable bolts at one-third the cost of a new frame; malleable-iron heads for these locomotive frames have been discarded and new heads of cast steel substituted at half the cost of malleable-iron heads; motor axles of high-grade heat-treated steels have been built up to larger diameter by electric welds on journal-box ends.

Large teeth on manganese roll segments have been sharpened by heating each tooth with an oxweld torch and hammering it to a point. Used sheaves with too few grooves have been combined with other sheaves to make a new sheave with the required number of grooves. Working barrels on reciprocating pumps have been made interchangeable so that only one spare working barrel need be kept on hand. To double their lives, rope-worn hoisting sheaves have been fitted with steel inserts.

Because extra heavy pipe failed to make satisfactory jack posts for heavy mine-chute jacks, such posts have been made out of scrap shafting by adding a short end-casting of steel. A $5\frac{3}{8}$-in.-diameter steel shaft that might otherwise have had to be bumped to $7\frac{1}{2}$-in. diameter for about 2 ft. at one end has been remodeled by pressing and pinning a steel bushing on the shaft.

Spray Metal Rebuilds Worn Surfaces—Metal sprays have been used successfully to salvage pump impellers, impeller and casing rings, frame heads of electric locomotives, pump-shaft sleeves, armature shafts

One of the many well attended sessions. C. C. Conway holds down a front seat in the center foreground.

Julian Conover, secretary, American Mining Congress, says mining is the prerequisite for victory.

J. D. Francis, president, Island Creek Coal Co., advocates that importance of coal be sold to mine workers; T. J. Thomas at left looking on.

Coal snapped up faster than we can mine it, was the declaration of J. Noble Snider, vice president, Consolidation Coal Co.

Left to right: T. J. Thomas, associate director, Solid Fuels Coordination; Charlie Dorrance, president, West Virginia Coal & Coke Corporation (speaking); and J. B. Morrow, president, Pittsburgh Coal Co.

Because of its troublous career, coal has not waxed "soft" with the years, says Harry M. Moses, president, H. C. Frick Coke Co.

Salvage director for the coal mining industry, R. E. Snoberger tells his audience how the FBI is ridding the United States of saboteurs.

Snapped at banquet—left, Admiral Thomas C. Hart; center, Mr. Moses, and right, Mr. Snider.

Turn the withering heat of coal on the enemy, pleaded E. J. Burnwell, chairman, Manufacturers' Division.

Flight of anthracite workers to defense industries and to army forces is described by W. B. Geise, labor relations, Susquehanna Collieries Co.

Another banquet picture with Harry C. Chellson, editor, and P. D. McMurrer, associate, Congress Journal, entertaining Mrs. Hart.

To evade priorities, says Edgar Schweitzer, assistant mechanical engineer, Lehigh Valley Coal Co., invade the scrap pile and make repairs with scrap with aid of a welding torch and rods of suitable hardness.

Genial gavel wielder is Charles W. Connor, general superintendent, American Rolling Mill Co., who took charge of Monday afternoon's Loading and Conveying Section.

I. N. Bayless, Union Pacific, pinch-hits for Paul R. Wickliffe, W. A. Wickliffe Coal Co., telling how the latter with high explosive and duckbills gets well-sized coal.

Chief Engineer E. H. Jenks, Rochester & Pittsburgh Coal Co., telling how to use rubber belts and declaring that steel in track and cars and copper in trolley wire are precious as rubber.

Chairman for the strenuous mechanical-loading program of Tuesday afternoon was R. E. Salvati, vice president in charge of operations, Island Creek Coal Co., of Holden, W. Va.

Ten points for successful mechanization are being expounded by August J. Breitenstein, assistant mining engineer, H. C. Frick Coke Co. Anticipated maintenance is among the most important of these.

Safety has a new and third consideration, emphasized E. R. Price, general superintendent, Inland Steel Co., as chairman of Tuesday's session on accident reduction in underground mining.

Better material has reduced the explosives hazard but more careful men alone can solve the rest, which now doesn't seem forthcoming, said B. L. Lubelsky, engineering manager, Powhatan Mining Co.

Sealing wastes is hazardous, declares Walter E. Buss, mechanical engineer, Knox Consolidated Coal Corporation, but leaving them unsealed is far more hazardous and costly if wastes must be patroled.

James E. Johnston, general inspector, Koppers Coal Division, advocates use of wetting agents to allay dust in coal mines.

J. S. Forman, vice president, Mt. Olive & Staunton Coal Co., takes the gavel at Tuesday's coal-preparation session.

That blueprints for shooting, cutting and drilling result in quality and high percentages of sizes was voiced by F. Earle Snarr, assistant to general superintendent, Chicago, Wilmington & Franklin Coal Co.

Conflicting interests make coal preparation difficult is the text of remarks by W. D. Steele, preparation manager, Consolidation Coal Co., but he adds metallurgical coal should have first place.

Suitable sizing speeds the drying of coals, asserted James Hyslop, general manager, Hanna Coal Co., and cuts moisture in the finest size in four by use of a continuous centrifugal dryer.

and locomotive axles. When pump-impeller rings wear at the periphery where they run inside the casing rings, they permit increased leakage within the pump.

To maintain minimum clearance, impeller rings are sprayed and refinished after they have been turned and then grooved with an unsymmetrical 60-deg. thread which is cut so as to anchor securely the $\frac{1}{16}$-in. thickness of metal to be applied. This work can be done without removing the impeller ring from the impellers.

Casing wearing rings are more conveniently repaired by removing the ring from the casing. These rings are of bronze or chrome iron and, after repair with $\frac{1}{8}$-in. stainless steel, their wearing resistance equals or exceeds that of the original material.

Pump-shaft sleeves of bronze or stainless steel worn by contact with packing also can be sprayed. Pump impellers erode where the ring is seated, and by metallizing methods the seat can be rebuilt. Armature bearings can be built up with 0.10-carbon steel wire.

Locomotive frame heads are supported in their split motor frames by a circular tongue-and-groove type of construction. After it is worn, the groove in the head is rebuilt with spray from an iron wire, thus depositing metal that can be machined easily. The circular tongue in the motor frame, however, can be more conveniently built by torch welding. The ball-bearing seats in the frame heads also are sprayed with metal from iron wire and reconditioned. Cost of such work usually is from 25 to 50 percent that of a new part.

In the past, economy has been the first thought of master mechanic and manager, commented A. R. Matthews, superintendent, Clover Splint Coal Co., Closplint, Ky., but now retention in service of what we already have, regardless of cost, has taken its place. Welding causes metal to warp and change its crystalline structure, so metallizing, which does neither, has its place in the reconditioning of equipment. Hard surfacing also sometimes will conserve material.

In discussion, Mr. Schweitzer said the cost of a metallizing gun was $1,400 to $1,600, so the use of the process would seem restricted to a central machine shop. Though it has limitations, the metallizer has a legion of opportunities for service.

"When one of our main drives began to fail, the metal sprayer was taken to the job, and thus the work was completed over the week-end and at a cost of only $550," declared T. F. McCarthy, general superintendent, Clearfield Bituminous Coal Corporation, Indiana, Pa.

Conveyors Save Man Power

Handle Coal, Not Rock—In 12 or 13 working shifts, duckbills will finish a room. Such a rapid rate of advance makes it possible to work it out before the roof weakens enough to settle. By this means, crossbarring at the Browder mine rarely has been necessary, declared I. N. Bayless, general manager, Union Pacific Coal Co., Rock Springs, Wyo., delivering a paper prepared by Paul R. Wickliffe, president, W. A. Wickliffe Coal Co., Greenville, Ky., at the foregoing session.

Hand Shovel and Black Powder Gave No More Lump—The coal is of a fairly blocky nature, yielding 16 percent of plus 6-in. coal when dislodged by black powder and loaded by hand shovels. Where the coal is loaded by duckbills, sheathed permissible powder is now being used and the percentage of premium-sized coal has not been reduced. In fact, by progressively shooting and alternately loading each shot, it has been possible to increase the percentage of such sizes without decreasing the efficiency of this equipment.

Some sections have excellent roof, and in other sections the roof is very tender. With shaker conveyors, the roof needs only two lines of props spaced at 4-ft. centers and set on either side of the center line of the room, but with hand-loading it was necessary to put the timbers so close that between them there was room only for a roadway. Whenever conditions are normal, a definite timbering system is followed. From the swivel of the duckbill pan to the face, Simplex roof jacks, which are quickly set and taken down, are provided. These are shifted as loading progresses across the face. As that face advances, the jacks are replaced by posts.

As drive, Goodman Type G30B77 units are provided, geared for 77 strokes per minute and fitted with what is known as a *B* motion. No. 3 troughs 10 ft. long and resting on silent roller trough supports and with a cross-sectional area of 105 sq.in. carry the coal. To prevent buckling or jumping, a few light guide frames are provided at high points in the trough line.

Use Three Headers Over Duckbill—No. 3 Elkhorn seam, said V. D. Picklesimer, general superintendent, South-East Coal Co., Seco, Ky., is being loaded with Goodman duckbills. The mine is approached by a drift and the seam runs from 36 to 65 in. thick, with a roof that varies from sandstone to a heavy slate. The bottom is of soft fireclay. These headers are placed over the duckbill. With the conditions as they are in this mine, no other equipment would have given equal satisfaction, asserted Mr. Picklesimer.

Belting in Indiana County, Pennsylvania—Mother belts, urged E. H. Jenks, chief engineer, Rochester & Pittsburgh Coal Co., Indiana, Pa., greatly simplify haulage, permit continuous car service and also eliminate the necessity for shooting down rock to provide headroom. The seam being mined with the aid of these belts is 37 to 42 in. thick, and, to provide headroom, bottom rock is lifted in the two center headings of each face, or flat, entry. Both of these headings are tracked, and crossovers are spotted so as to give service to any butt heading without any interference with the service of any other.

Butt headings are driven 2,000 ft. long and the rooms which are driven from them on either side are worked on full retreat, the pillars between

them being recovered. The flat entry with its six headings is driven by nine conveyors and the mother conveyor. Two in the extreme right and left headings are of the same type and must have enough capacity to take the coal from the six working places.

Moving Belts Forward—When the entry is driven to the limit of the conveyors, all advancing conveyors except that in the extreme right heading are moved forward, and the cross conveyor which receives the coal from advancing conveyors is shortened so that it will load the cars on the right-hand haulroad. The long mother conveyor also is advanced to the right airway, and the conveyor which had been loading the coal into the mine cars is moved up to act as a cross conveyor, receiving the coal from all the advancing conveyors extending from the left to the extreme right heading.

This permits the rockwork to be advanced to the limit in the heading which is not being used for coal haulage. At the same time, coal is being loaded out on the advancing headings. In this plan, car service is not interrupted when car changes are made, and the haulage should be planned so that the interruption is held down to a minimum.

In this mine, the flat entries can be advanced more rapidly than is necessary to maintain production; therefore the same conveyors can be used in the flat headings to advance them about 600 ft., which is the distance between butt headings.

Save Rubber but Use Steel and Copper—Use of rubber belts, declared Mr. Jenks, may seem unpatriotic, but to replace them with track and trolley wire might be as injurious to the war effort as to supply enough rubber to keep them in operation. Belts and multiple conveyors also conserve man power.

If payment for loading on belts is made on a tonnage rate, group payment is involved; therefore care should be taken to select men for each crew of, as nearly as possible, equal ability. If any in the crew is not up to par, discontent will cause the tonnage of the best men to slip down to that of the least competent and least industrious man. Multiple shifts increase the difficulty, as the men on one crew will not do anything to help the shift ahead, in the hope that the other shift will do as much for them. Especially is this true of three-shift work, for the shift that the first shift helps will not be the shift that can help the first shift.

Reason for Clean-Up System—This leads to the establishment of a "clean-up 'system" and of an arrangement by which width of place and size of crew are designated so that the loading of a certain number of cuts with all incident work will constitute an average day's work and will be made the crew's stint. The supervisor should see that all the incident work is done at the correct time so that at the end of the working day the work planned will be completed.

No Belts Have Needed Replacement—The Rochester & Pittsburgh company started using belts three years ago and is now operating 18 belts with a little more than 10 miles of belting, but wear has not made necessary the replacement of any belt.

For long life, belts must be level from side to side. Unequal loading, said A. E. Long, engineer, Clearfield Bituminous Coal Corporation, Indiana, Pa., makes difficulty. It is not so injurious on the top as on the bottom strand. Any such irregularity will wear off the side of the belt. Belt repairs should not be delayed, for splicing will take an hour or more. Meantime, that section of the mine will be laid idle. If repairs are made promptly, splicing will be unnecessary.

Sometimes belts are best, sometimes cars, soliloquized Carel Robinson, consulting engineer, Charleston, W. Va. After all, cars involve the use of a large quantity of steel, so perhaps patriotic considerations may not be involved in a choice of transportation facilities.

Weighs Coal on Belt—The Carbon Fuel Co., with mines in Kanawha County, West Virginia, asserted T. W. McGuire, mining engineer of that company, had a 30-in. seam of coal that it was mining with the aid of belt conveyors. It had a 350-ft. belt which was fed from a balance bin equipped with a Weightometer. This bin was fed by two mother belts. Absenteeism and lack of men was making operation difficult. In reply to L. E. Young, consulting engineer, Pittsburgh, Pa., he said that all coal is weighed at this one point and all loaders are paid by the ton. Payment is made on a measuring basis corrected and checked by the weight as determined by the Weightometer. The mine works two shifts.

Near the bottom of the seam there is some impurity, so 4 in. of coal is left near the floor. Otherwise, the coal is clean and no coal is docked for impurity. In reply to Carl Scholz, consulting engineer, Charleston, W. Va., he said the Tonnage Rateograph, of the Merrick Scale Mfg. Co., was used. This cost about $3,000, so he was not disposed to make the outlay for every belt and experience had shown that this expenditure was unnecessary.

Speeding Machine Loading

Mechanization's Ten Commandments—Ten cardinal principles are essential to a successful use of coal-loading machines, declared August J. Breitenstein, assistant mining engineer, H. C. Frick Coke Co., Uniontown, Pa., at the afternoon meeting of April 28, with R. E. Salvati, vice president, Island Creek Coal Co., Holden, W. Va., in the chair. These principles are:

(1) Provide a carefully worked-out mining plan, in which loading machine and face-preparation movement will not be hampered. (2) Restrict mechanical loading to new sections where possible (work in old cut-up sections seriously handicaps machine operation). (3) Provide adequate and positive ventilation, drainage, power distribution, fire protection, rock-dusting, transportation and face preparation facilities, so that these jobs will be performed

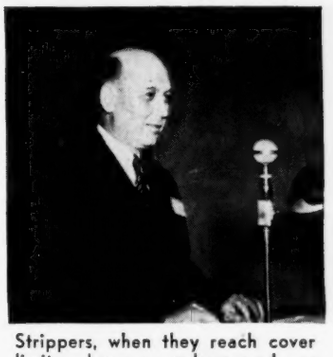
William L. Burt, vice president, The Jefferson Co., Ohio State chairman of program committee, shines as introducer of introducers, sending both Mr. Bixby and Mr. Spencer off the runway.

K. R. Bixby, general manager, Midland Electric Coal Corporation, opens the first strip-pit mining session, and Lafe Stewart, chief engineer, Maumee Collieries Co., waits on the side lines to address the congress on draglines vs. shovel.

And K. A. Spencer, vice president, Pittsburg & Midway Coal Mining Co., follows him at the second strip session as chairman of that meeting. He said later he also was "pinning" coal or should it be "unpinning" it.

Impedance in the ground connection, declares Russell L. Alpine, Enos Coal Mining Co., will save men from electrocution or severe shock in case of a fault and contact with the shovel frame.

Lafe Stewart, telling how shovels and draglines work in tandem. Sometimes the dragline leads, sometimes the shovel. Long reach and depth are the dragline's long suit, but in rock it is at a disadvantage.



Strippers, when they reach cover limits, burrow underground as they always have. But their underground plants are now, like their strip pits, up to date and efficient. J. M. McCoy, engineer, Truax-Traer Coal Co., shows how to do it.

Teeth do their digging 200,000 times a month, penetrating 100 to 180 miles of bank, remarks O. E. May, chief engineer, Northern Illinois Coal Corporation. For a long and efficient life they must be kept fit by welding.

Haulage in eastern Ohio is difficult and the largest haulers are 25-tonners. A. D. Henry, assistant superintendent, The Jefferson Co., describes conditions in that district. Gradients are held to 6 percent.

Pinning—to wit, a new way of driving a big pin in a coal seam to fracture it evenly—is being described by C. M. Guthrie, superintendent, Seneca Coal & Coke Co. This eliminates explosives and thus some hazards.

safely and production delays will be kept to a minimum. (4) Eliminate necessity for handling drawslate in machine sections. (5) Adopt an operating program of two-shift loading and three-shift cutting and face preparation, except in periods of peak demand.

(6) Concentrate attention of the mine management on improvement in face-preparation methods such as will permit the loading machine to rotate if possible within less than a six-rib section, thus further restricting open territory for any given rate of production. (7) Train and encourage the assistant mine foremen to keep in touch during the entire shift with all details of face preparation, for this will furnish the greatest opportunities to increase efficiency in the over-all mining operation. (8) Adopt a complete and adequate program of preventive or anticipated maintenance to eliminate delays caused by machine breakdowns. (9) Train men individually and carefully for standardized and definite jobs covering all the several elements in the mechanical-mining operation. (10) Develop and introduce a standard production and cost procedure for the control of mechanical-mining operation and so as to obtain comparative performance data on various machine applications.

Supporting the Roof and Letting It Down—In reply to Robert Dickson, safety engineer, West Virginia Coal & Coke Corporation, Omar, W. Va., Mr. Breitenstein said that, in drawing pillars, the open end is first center-posted. Then the track is lifted. Posts are drawn from the end back to the road either with post pullers or, near the roadway, with a locomotive. However, the latter method of pulling posts is not much used. Sixty percent of the crossbars are recovered. In reply to L. E. Young, Mr. Breitenstein declared that two 3-in. H-beams welded together are used for support near the face. A two-man timber crew places the timber.

Answering J. G. Green, electrical engineer, Columbus Mining Co., Allais, Ky., Mr. Breitenstein stated that the use of loading machinery had not resulted in a saving of timber. He said, replying to Ernest B. Agee, general superintendent, Buckeye Coal Co., Nemacolin, Pa., that the loading operations "can skin through" on five blocks, but with six they can do better work, as they have more leeway.

George E. Stringfellow

Vice president, Thomas A. Edison, Inc.; first vice chairman, American Mining Congress.

Shuttle Cars Make a Big Mine Small—In the Springfield (Ill.) mining district, mechanical loading has several distinct advantages over hand loading, declared Dr. C. J. Potter, assistant to the president, Rochester & Pittsburgh Coal Co., Indiana, Pa., reading the paper of A. F. Phillips, mine superintendent, Peerless No. 59 mine, Peabody Coal Co., Springfield, Ill. He listed the advantages as: (1) enabling mine operations to be confined to a small area, and (2) providing closer supervision over the work, which can be performed by a smaller working force if the coal is loaded with tractor loaders in a shuttle-car section.

At his mine, the coal is loaded with tractor-mounted loading machines and transported by rubber-tired shuttle cars to an elevating mine conveyor, by which it is delivered into mine cars that haul it to the surface. The coal is both sheared and cut with a 9-ft. cutter bar. Crosscuts are provided for car changing 120 ft. from the mouth of each room. Batteries can be changed in 15 to 20 minutes.

The shuttle cars are of the 42D type, with a capacity of five tons. Their rear wheels are equipped with 10x20 tires and the front wheels with 7:50x20 tires.

Safety Means More Tonnage

New Slant on Safety—Because of the man shortage resulting from the war, safety in mining has now a third and new slant. After the compensation laws were passed, humanitarianism was supplemented by economic considerations, and now the conservation of man power, a pressing war need, has been added as a new reason for the utmost effort for safe operation, if any additional impulse is needed, asserted E. R. Price, general superintendent, Inland Steel Co., Wheelwright, Ky., on taking the chair, in the "Phases of Safety" session, April 28.

Reduction in Blasting Accidents Disappointing—Accidents which result directly from the method of firing, said B. L. Lubelsky, engineering manager, Powhatan Mining Co., Powhatan Point, Ohio, have materially decreased since cap and fuse or the miner's squib have been replaced by the electric blasting cap or the electric squib. Those accidents which are directly related to the explosive used also have been reduced, although not in the ratio that might have been expected, though permissible explosives have in a degree displaced black blasting powder. Accidents that arise directly or even indirectly from the handling and use of explosives are definitely not decreasing, despite the fact that the potential hazard has been reduced greatly by the increase in the use of both permissible explosives and electrical blasting.

Good Tamping, Powerful Wallops—Brush, said William D. Northover, safety engineer, Rochester & Pittsburgh Coal Co., should never be allowed to grow near magazines. Stress should be laid on adequate tamping. Eight lead blocks were

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Security Program Guards Mines Against Sabotage

A mine security program designed to protect the nation's mines from sabotage efforts has been announced by Secretary of the Interior Harold L. Ickes. The mines program will be coordinated with the activities of other governmental agencies. Tentative plans submitted by Dr. R. R. Sayers, Director of the U. S. Bureau of Mines, call for immediate setting up of a specially trained field force in all the mining areas of the United States. Funds for this purpose were appropriated by Congress in the Sixth Supplemental Appropriation bill just signed by the President.

Under the plan a Division of Mineral Production Security is being organized in the Bureau of Mines' Health and Safety Branch under Dan Harrington. The Coal Mining Section of the new division will inventory coal mines and inaugurate security measures. Likewise, a Metal and Non-Metallic Mining Section will establish a security program for such mines in the United States.

The work of both sections will be closely coordinated with other units of the Bureau, including the Safety Division, the Coal Mine Inspection Division and the Explosives Control Division. The established mine safety districts throughout the nation will serve as directing centers for these activities, although the personnel will be directed from Washington.

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Check Salvage Program

The Industrial Salvage Section of the Bureau of Industrial Conservation, WPB, is distributing report blanks, printed in the form of self-addressed postcards, setting forth the movement and disposal of scrap materials. The blanks are being distributed by regional offices of BIC and it is hoped that they will eventually be placed in the hands of the salvage managers of all American manufacturers.

BIC expects the reports to give some measure of the progress of its industrial salvage program. Further, the cards should provide a definite check on what industries and what committees in BIC's Industrial Centers Organizations are keeping accurate data on their salvage efforts. The Bureau is appealing to all salvage managers to fill out and return the cards as soon as possible.

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Powders and Cleans Coal by Blasting Its Pores by a Release of Steam

BY FILLING its pores with steam and suddenly releasing the external pressure, coal can be so finely pulverized as to be suitable for burning under boilers as powdered fuel. A study sponsored by the Peabody Coal Co. at the laboratories of the Armour Research Foundation, Chicago, has shown that coal can be exploded into fine particles by principles similar to that used to make puffed wheat and other puffed cereals, but the coal is not puffed but blasted by the steam. Bone and pyrites resist more resolutely than coal the action of the blast, so that, by screening, the coal can be both cleaned and pulverized in the one operation. Recycling makes coal of any fineness desired.

In their early experiments, the investigators used a tube with heavy walls filled with coal and water and sealed at one end by a thin metallic disk so selected as to rupture at a preassigned pressure. The tube was heated by an external electric winding, and the water converted to steam. When the steam had reached the required pressure, the seal broke and its sudden expansion burst the coal to pieces which were ejected from the tube into an open receiver.

Later, a new tube was built with a hydraulically operated quick-opening valve to replace the rupture disks and a special high-pressure steam boiler to furnish controlled steam. Thus, effect of steam pressure, time of soaking, and quickness of release on the yield of fines could be studied. Battering of the discharged coal against a target further pulverized it.

By resubjecting the broken pieces resulting from one expansion to another, the same ratio of yield of fines was obtained, and the ratio maintained itself in successive explosions. This makes it possible to introduce classifiers and separators which will control the size of the final output, because the larger sizes can be fed to the expansion tube for their further pulverization.

Because their porosities vary widely, the new method may not be equally applicable to all coals. Other coals than on those from the Illinois field remain to be tested. Larger-scale tests also are necessary to establish the comparative costs of this system and of the present mechanical methods of pulverization. The possibility of a reduction in the ash content of the coal in the process of pulverization is an added incentive to the development of the process. Steam consumption for a commercial application is calculated to range between 106 and 151 lb. per ton of coal pulverized.

Under one set of conditions, a slow release of the steam pressure caused the coal to expand permanently into a highly porous structure. A caked mass resembling semi-coke resulted when the coal was heated into the plastic range in an atmosphere of steam.

Steam-Blasted Coal

Since 1921, when G. J. Bancroft patented a method of splitting mica by soaking it in water and heating it to some desired pressure and then suddenly releasing that pressure, many applications have been made of that method of breaking up solid substances. The U. S. Bureau of Mines has used it on ores and the University of Minnesota on limestone. Now, it is applied to coal, which when heated and steamed softens and acts like many other colloids.

It has been proved that coal can be comminuted by expansion of the steam in its cells if the pressure out-

side is suddenly released, but what remains to be ascertained is whether such a means of comminution will have economic value, just what pressures must be used and how long the coal must be steeped in the steam so as to make it and the steam ready to play their several parts. The coal engine which uses pulverized coal instead of gasoline or diesel oil may be brought nearer consummation by this ingenious device.

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Control Vital Materials In Safety Equipment

In order to conserve the supply of materials urgently needed in war production, strict regulations on the use of aluminum, copper, plastics, and several other commodities in the manufacture of safety equipment were put into effect by the War Production Board on May 5. Safety equipment as defined by the order covers a wide range of devices, signs, etc., used to promote safety or to prevent accidents, injuries or occupational hazards. Included in the definition are guards, shields, belts, shoes, protective clothing or coverings, masks, respirator inhalers, resuscitating apparatus, measuring instruments, indicating instruments, protective creams, treads, warning signs and all other such safety articles.

The order prohibits the use of scarce materials in these items except: (1) for A-2 or higher rated orders, if the equipment was manufactured prior to the date of the order, or from parts ready for assembly on the date of the order; (2) containers, harnesses, head gears, as permitted by an appendix to the order, or (3) within 90 days of the effective date for delivery to the Army, Navy or Maritime Commission.

Other critical materials affected are asbestos cloth, chromium, copper-base alloys, nickel, corrosion-resisting steel, alloy steel, tin, synthetic plastics, magnesium, rubber, synthetic rubber and neoprene.

The appendix permits the limited use of several of the critical materials for specific purposes which are judged essential.

Says Time Lost by Accidents in 1941 Would Build 66 Battleships

A MOVEMENT has been organized by a group of the nation's leading corporation executives to stem the mounting drain on industrial manpower through accidents, as was announced April 30 by W. A. Irvin, former president of the United States Steel Corporation and chairman of the newly formed War Production Fund to Conserve Manpower.

The announcement was made following a meeting of the trustees of the National Safety Council, where communications were read from President Roosevelt and Donald Nelson, Chairman of the War Production Board, commending industrial leaders for taking the initiative in an undertaking of such consequence to the national war effort.

The War Production Fund resulted from a proclamation of President Roosevelt calling upon the National Safety Council to mobilize the nation's volunteer resources against a rising accident toll that last year claimed the lives of 101,500 persons, permanently disabled 350,000, injured 3,750,000 workers, and deprived industry of 460,000,000 man-days of labor.

Against the background of the country's urgent need for skilled manpower these facts stand out sharply:

1. Accidents last year were the first cause of death among all men from 22 to 38 years of age.

2. In 1941 alone, accidents (both fatal and non-fatal) cost as many productive man-days as would build 66 battleships—nearly twice the number possessed by the combined American and British navies.

3. About 47,000 workers of all ages were killed, representing labor sufficient to build 20 battleships, 200 destroyers and 7,000 heavy bombers.

4. Accidents cost $3,750,000,000, enough to pay the entire expense of running New York City for six years.

To curb the mounting losses of life and interruptions to war production, the President has called for a "concerted and intensified campaign against accidents," whereby the National Safety Council would extend tested accident-prevention techniques more widely throughout the country's 196,000 industrial plants, and carry a thorough program of safety education to the homes, farms, and schools of America.

Those elements most vitally concerned with speeding war production—the nation's business and industrial interests—will be enlisted in support of the program, Mr. Irvin said, while making public President Roosevelt's letter, which read in part:

"It is obvious from the very magnitude of the toll in deaths and injuries that accidents constitute one of the serious impediments to our war production. The sort of broad program through which the National Safety Council proposes to extend accident-prevention work more widely throughout the country is, therefore, a national necessity at this time. For this reason the movement in which you are engaged must be regarded as an integral part of our national war effort and deserves the fullest support of the people of this nation."

Studies made by the National Safety Council indicate that industry was deprived by accidents of 10 percent more man-days last year than in 1940, and the first month of this year showed a continuing rise as compared with the corresponding month of 1941.

In several states, surveys indicate the probability of even greater accident losses unless the present trend is checked. In twelve states, the death toll from occupational accidents alone showed increases in 1941 ranging from 25 to 77 percent. Yet in the many states and communities where sound safety programs have been instituted, accidents have dropped 50 percent and more.

The conclusion, based on the entire history of safety accomplishments, is that the accident toll per-

sists and grows because hardly more than 10 percent of the population is reached by tested safety practices.

"In terms of production, the minimum expectancy in economic savings, under an effective, broad-scale program, would buy 10 battleships of the North Carolina class, 2,100 flying fortresses, or 6,600 heavy tanks.

"It is estimated that the expanded safety program will cost $5,000,000, and the War Production Fund has undertaken the responsibility of financing the project through enlisting the support of the nation's major industrial and business corporations."

Our Way of Life

In most industries the war increased the fatality rate, but in the bituminous coal industry it lowered it to 2¼ lives per million tons of coal produced in 1941. And yet the mines are deeper and gassier than ever and, if mechanization is to be rated as a hazard, more mechanized than at any time in the history of coal mining. To those who say, "Why isn't something done about it?" the answer is: "Something is being done." Since 1907, the industry's most fateful year, its death rate has been cut by two-thirds. Yet the end has not yet been reached, as lowering figures, decade by decade, testify. The War Production Fund to Conserve Manpower, of the National Safety Council, advocates safety to meet the rising toll that last year claimed the lives of 101,500 persons and deprived industry of 460,000,000 man-days of labor, enough to rebuild the American and British navies twice over. That increased safety is just what the coal industry was providing during 1941, though it had to part company with other industry in so doing.

However, 1942 will have hard sledding because of the accident at the Christopher No. 3 mine in which some 75 men were killed. With a unique roof hazard rendered almost uncontrollable by the continued extension of workings, with a gas hazard far more baffling than that which kills so many people in their homes and with a dust hazard more difficult than that in the milling industry the coal mines have also all the electrical, mechanical and transportational hazards of ordinary industry and so judgment can be rendered only by comparing its present with its past record.

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Amend Preference Order To Include Explosives

Preference Rating Order P-56 has been amended to add explosives and explosive equipment to the list of mining machinery and equipment in Schedule A of the order. This enables mine operators who have serial numbers under the order to use an A-1-c rating in obtaining repair parts for such equipment.

To clear up some confusion which has arisen as a result of this amendment, Wilbur A. Nelson, Administrator of the Mining Branch, WPA, explained that the A-1-c rating is applicable for repairs to blasting machines and similar machinery and equipment but that the rating may not be used for ordinary operating supplies such as black powder and dynamite, to which the A-8 rating remains applicable.

Mines which do not operate under P-56 may use an A-10 rating under the general repair, maintenance and operating supplies order, P-100, to obtain explosives. The amendment to P-56 does not affect any existing priorities on explosives and explosive equipment, nor does it prevent any mine operator from obtaining explosives in the same way as before the amendment was issued.

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Maximum Prices Set On Machines and Parts

A comprehensive regulation establishing maximum prices for machines and parts not covered by other price schedules was announced May 2 by Price Administrator Leon Henderson. The measure—titled Maximum Price Regulation No. 136—which is part of the Price Administration's over-all formal price stabilization program, supersedes all outstanding freeze letters and informal agreements covering machinery.

Effective May 18, 1942, the new regulation specifies Oct. 1, 1941, prices, for the machines and parts it covers, at all levels of distribution except retail. Rental levels of the same date also are established as maximum. Included in the machines and parts covered are mining machinery.

The Price Administrator pointed out that some 90 percent of the manufacturers producing machinery have been operating previously under a number of voluntary price control programs based on the Oct. 1, 1941, price level or a closely comparable date. Hence, price levels in March, 1942, generally were the same as in October, 1941. However, there were some violators of the voluntary freeze letters. Thus, establishing a formal price ceiling as of the March, 1942, level, by permitting each seller to continue the prices he charged during March, would reward those who had failed to cooperate, and, in effect, would discriminate against those who had cooperated. Therefore, it was decided to use Oct. 1, 1941, as the base price instead of March, 1942."

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WPB Regional Offices Are Established

One of the most important steps yet taken in the decentralization of War Production Board activities throughout the nation was announced May 12 by James S. Knowlson, Director of Industry Operations, with the issuance of orders and regulations officially setting up 13 regional offices and vesting broad authority in the regional directors. The new step, which is in line with general policy to decentralize WPB operations as much as possible, involves two documents: (1) a General Administrative Order formalizing the 13 regional offices, and (2) a set of administrative instructions outlining the functions and duties of the regional directors.

The broad duties to be assumed by the regional directors are given in Sec. 2 of the administrative instructions, which says:

"In general, the regional offices

shall provide the focal point in each region for all War Production Board business, and the regional director will be the representative of the Chairman of the War Production Board within the region.

"It is intended that the decentralization of War Production Board activities shall be progressively developed to the end that, so far as practicable, the work of the War Production Board in Washington shall center in policy determination, program planning, the institution of major procedures and general coordination, while the day-to-day operations shall be conducted through the regional offices.

The 13 regional offices established are: (1) Boston, (2) New York, (3) Philadelphia, (4) Atlanta, (5) Cleveland, (6) Chicago, (7) Kansas City, (8) Dallas, (9) Denver, (10) San Francisco, (11) Detroit, (12) Minneapolis, (13) Seattle. So far, these regional directors have been appointed: Walter H. Wheeler in Boston, Orville H. Bullitt in Philadelphia, Ernest Kanzler in Detroit, Frank H. Neely in Atlanta, John C. Virden in Cleveland, and Joseph L. Overlock in Chicago.

Payroll Savings Plan Advocated By Secretary Morgenthau

OPPORTUNITY should be given every employee to purchase as many U. S. Savings Bonds as he can afford by deductions from his pay envelope, declared Secretary of the Treasury H. Morgenthau, Jr., in a letter addressed to business firms throughout the United States:

"Since the Defense Savings program was launched in May, 1941, events of far-reaching importance have occurred. To preserve our very existence we have been compelled to wage war upon far-flung battle lines. To maintain them the President has said that during 1942 we must produce over 60,000 planes, 45,000 tanks, 20,000 anti-aircraft guns, 8,000,000 tons of shipping, and mobilize, train and equip millions of fighting men. Upward of 50 percent of our total productive capacity and an equal share of our national income must be diverted to making war materials.

"This has meant a tremendous increase in the financial problem facing the government. Reliable estimates indicate that during the next fiscal year—that is from July 1, 1942, to June 30, 1943—we shall spend about 60 billion dollars.

"The Revenue Act as it comes from Congress will determine how much of the money needed to finance the war is to be raised by taxation. The rest must be borrowed by the Treasury. In all probability, 35 billion dollars will have to be borrowed between now and this time next year.

"When bonds are purchased with savings out of current income, such savings reduce excess consumer income which if spent for a limited supply of consumer goods tend to force prices up. It is for this reason, among others, that we are going directly to the people for as much as possible of the money needed for the war.

"It would be difficult to say exactly how much we can borrow directly from the people. We cannot, of course, hope to borrow in this way all that will be needed. Nevertheless, some definite objective is desirable if we are to have a standard by which to measure our success.

"We have, therefore, set as our goal for the twelve-month period beginning July 1 the sale of U. S. Savings Bonds, Series E, F and G, having an initial cost value of not less than $12,000,000,000. This will be a little more than 10 percent of our estimated national income during that same period.

"Sales of Defense Bonds during the period May, 1941, through March, 1942, amounted to $4,860,000,000, or an average of about $440,000,000 per month. If we are to reach our goal, an average of a billion dollars a month, we shall have to increase this rate of sale about 2½ times.

"The most effective single method for promoting systematic purchase of U. S. Savings Bonds is through the payroll savings plan. Already nearly 50,000 firms in the United States employing a total of almost 20,000,000 people have made such plans available to their employees. I am suggesting, therefore, as a total or quota for those administering the payroll savings plan, that at least 10 percent of gross payroll be set aside by employees for purchase of U. S. Savings Bonds."

Tithing

Lending the government a tenth of one's income—and as much more as can be spared—is hardly giving till it hurts. The coal industry, it would seem, should make 10 percent its base and write the contribution "10 and up." After all, it is but a loan at interest and not a gift, and the less we spend the less likely we are to have prices kite, making our money valueless. Hence, we save three ways—save our liberties, preserve our money values and put by a nest egg which brings a satisfying rate of interest. We are all shareholders in the U. S. A., Inc., and should see our firm through this critical period.

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Inquire on Price Ceiling To Coal Division

Correspondence and personal inquiries relating to Maximum Price Regulation No. 120—Bituminous Coal Delivered From Mine or Preparation Plant—should be referred directly to the Bituminous Coal Division, according to a procedure outlined May 12 by Price Administrator Leon Henderson.

This procedure was worked out through an exchange of letters between Mr. Henderson and Secretary of the Interior Harold L. Ickes under which an arrangement was made that BCD would cooperate with OPA with regard to price control of sales of bituminous coal by producers, distributors and sales agents. Under this arrangement, the Division participated in the formulation of Maximum Price Regulation No. 120, issued April 28 by OPA.

This advertisement also appeared in:
NEW YORK TIMES
CLEVELAND PLAIN DEALER
CHICAGO DAILY NEWS
DETROIT FREE PRESS
WASHINGTON POST

You Expected to Read This NEXT YEAR!

Industry after industry is beating its promise as America's war production sets new world's records . . . Management, labor, W. P. B., Army, Navy, the Maritime Commission and other government departments are cooperating to make next year's headlines come true THIS year.

In World War I, the Kaiser feared American manpower. In World War II, Hitler is even more fearful of our rapid transition from peace to war production. . . . He has reason to be afraid.

Printing press factories are exceeding quotas on anti-aircraft gun parts.

Spark plug manufacturers are setting new speed records in machine gun production.

The heavy-transportation industry is making giant chassis for big guns at a faster rate than all the Axis powers combined.

In this industry, men who used to make locomotives and tractors are changing "Too Little and too Late" to read "Too Much and too Soon," from the enemy's viewpoint.

Starting just a few months ago, with a bale of blueprints and a knowledge of how to build such things as road-scrapers, power-shovels and trucks, the heavy-transportation industry is turning out mobile artillery that will shake the earth in more than a literal sense.

• • •

The story of how this industry joined the army carries a significance which should be understood and remembered.

The significance is that America has solved the problem of exchanging production techniques between specialized industries. This process went on unnoticed in peacetime. War gave it prominence.

OVER

▶When the bales of blueprints were first delivered, and the heavy-transportation industry started on its job of producing prime-movers and chassis for big guns in quantity, new production techniques were needed in a hurry.

▶Here are some of the questions that arose:

"How do you weld such heavy sub-assemblies?"

"What welding fixtures will handle these parts so that our workmen can always weld down-hand?"

"How can we make these long, heavy welds and have sound metal from one end to the other?"

"What's the best technique for testing welded parts? Shall we x-ray, or use the magnaflux process?"

"What's the best way to support these welded assemblies for machining?"

That's just a few of the thousands of questions that arose in the minds of experienced men when they had to solve new problems.

They illustrate the fact that American production methods depend upon specialized techniques and machines.

Each man with such a problem knew that someone, somewhere, had solved his problem, or might solve it before he could work out his own answer.

Therefore he turned to the source of industrial information he had always used when he wanted to know what others were doing . . . his industrial magazine.

Ever since the Maginot Line was flanked, the Industrial Press of America has been helping rookie industries to become veterans in the battle of war production.

▶It doesn't do this by exhortation or command, but by answering thousands of specific questions.

Just as newspapers keep their war correspondents at the front, Industrial Magazines keep their "war-production-correspondents" in the plants where weapons and equipment are made. McGraw-Hill editors are mobilized for war as literally as though they were firing weapons instead of helping to produce them. More than 90% of the time of McGraw-Hill's 153 editors and 725 engineer-correspondents is devoted either to visiting war-production plants (to study production techniques) or in writing "war stories" on how production problems were solved.

"Know-how" is the secret of the amazing records now being made by American Industry. And "know-how" comes from thousands of "little facts" like this:

Information on tool shapes for cutting the harder steels of war is vital literature to the engineer, designer or production man with the particular problem of cutting those steels confronting him.

The industrial editor does not work alone in giving vital information to men on the production line. In much the same way, manufacturers are war-converting their industrial advertising to show their readers how to use their products more effectively. For instance:

A business-paper advertisement showing how to make old taps and dies last longer has no glamour for anyone but the man who must rush production with an inadequate supply of new ones. To him it has enough "oomph" to be clipped and placed on his office wall.

To the casual observer, the Industrial Press is about as exciting as the rows of wires that stretch along every road and railway. . . . The simile is very apt. Both exist solely for the interchange of ideas. Both are typically American in the extent to which they have been developed and applied to the whole economy. . . . *This advertisement published by the McGraw-Hill Network of Industrial Communication.*

• • •

THE McGRAW-HILL NETWORK

23 PUBLICATIONS WHICH HELP MORE THAN 1,000,000 EXECUTIVES, DESIGNERS AND PRODUCTION MEN TO EXCHANGE IDEAS ON WAR-PRODUCTION PROBLEMS

American Machinist • Aviation • Bus Transportation • Business Week • Chemical & Metallurgical Engineering • Coal Age • Construction Methods • Electrical Contracting • Electrical Merchandising • Electrical West • Electrical World • Electronics Engineering & Mining Journal • E. & M. J. Metal and Mineral Markets • Engineering News Record • Factory Management & Maintenance • Food Industries • Mill Supplies • Power • Product Engineering • Textile World • Transit Journal • Wholesaler's Salesman. Also publishers of thousands of books for technical and engineering schools and colleges, as well as for general business use.

McGRAW-HILL PUBLISHING COMPANY, INC.

330 WEST 42nd STREET, NEW YORK

WELDING A "MUST"

For Continuity of Operations And Low Maintenance at Mechanical Mines

Welding at Zeigler No. 1 mine, which was at first merely an incidental gadget, is now the major maintenance tool from shop to working face. Biggest savings are made in the larger rebuilding jobs, but even on the smaller ones reduction in lost time, better equipment performance and increased life make welding well worth while. Portable outfits for face work are especially desirable.

By ERNEST PRUDENT

Superintendent, No. 1 Mine
Bell & Zoller Coal & Mining Co.
Zeigler, Ill.

WELDING at Zeigler No. 1 mine in 1917 was at first more or less accidental. Though the results of this accident have no especially significant relationship to present-day maintenance practices, which are greatly dependent on welding, I shall always remember the incident and I now wonder what would have happened if the accident had been passed up, forgotten or not enlarged upon. There is no doubt in my mind that welding in its modern aspects would now be employed in our mine, but I doubt if I still would be head of the maintenance department.

Life Before Welding!

During 1916, 1917 and 1918, we repairmen had to contend with many difficulties, the foremost being man and material shortages, long hours seven days a week, and a constant demand for more coal. We survived only because we were young and strong, with possibly the man shortage also a contributing factor. Were the same conditions to exist under the highly mechanized conditions now found in a growing number of coal mines, I am sure we would be unable to carry on without modern welding.

The significance of the following account of our first welding experience may be difficult for some young miners to comprehend, but to me, still with a vivid recollection of mining in 1916-18 to contrast with the present, it is tremendously important. By this time, most of the readers of this article will be anxious to hear of the accident which introduced and gave impetus to welding in our mine, but, as I want to tell the story in my own way, I beg of them to bear with me. My sole objective is to have some operating management, not so well sold on "new frills" to take a tip from this account, fall for some welding salesman's line, buy the repair gang a suitable welder and send it down to the mine, and then forget about it completely for a year. When the boss checks up at the end of that time, if he himself does not feel a strong urge to weld, he will at least want everyone working under him to be a welder.

Because men were scarce in 1916-18, a repairman of any merit or experience whatever had an advantage over his less experienced brothers and was in a position to ask for and get day work. Consequently, repairmen for night work were scarce and generally those that did venture into it had everything to learn. This opportunity for learning led to our welding accident.

In repairing a mine locomotive built in 1907, one of the repairmen, in moving it off the pit, allowed the trolley cable lead to be pinched between the steel trolley housing and a brake crossbeam on the locomotive. The trolley circuit breaker on the shaft bottom opened, it is true, but the arc lasted long enough to weld securely two 1-in. nuts and thereby secured the brake beam to the locomotive side frame.

I did not learn of this at the time, and so was surprised when I found a few days later that all six of the nuts holding the crossbeam to the frame were arced over with a copper deposit on each nut. I went out to see these repairmen a few nights later and inquired what had happened. The men reported that every night or so the nuts in question would work loose with the exception of the two that had been arced over. They therefore had decided to treat the others the same way, using an old locomotive resistor and a piece of 1/0 copper wire.

Bought Only for Rail Bonds

Not long after this, a salesman with a grid resistor and a steel rod for bonding came along. Up to that time, bonding had required drilling holes in the rails into which the bond terminals were pressed. We were deeply impressed with this salesman's offerings. Twice as many bonds could be put on by the arc method with half the effort. After purchase of the welding resistor, our experience was much the same as that of other mines, viz: the bonding resistor was always needed for odd jobs in the repair shop, mostly weld-

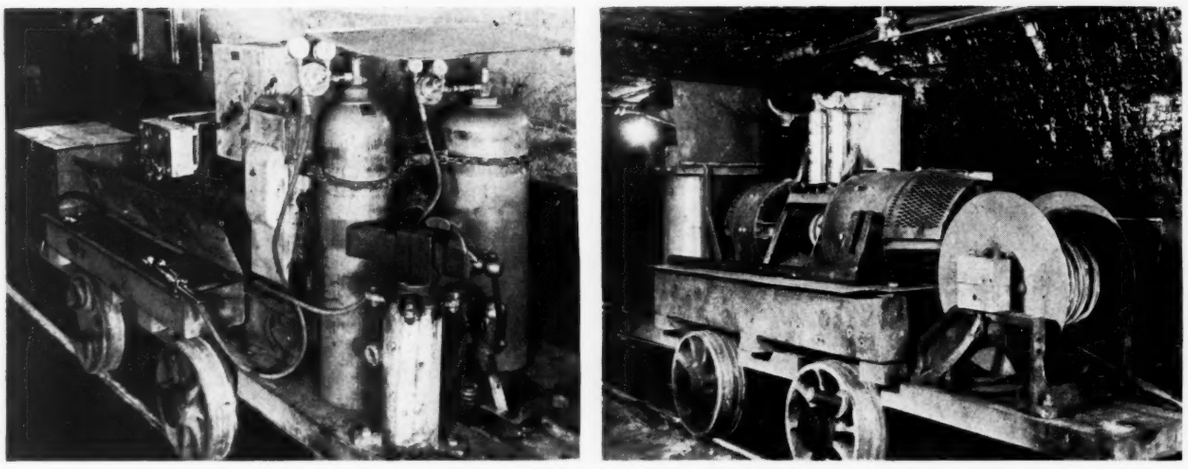


Fig. 1—Two views of the Zeigler No. 1 portable cutting and welding outfit for face work.

ing nuts on split gears that invariably would come loose regardless of lock washers and split keys. Very shortly, a second resistor was obtained and all split gears were welded solid.

Today, this mine has three welding generators, one of which is portable. We boast of eight welders, all trained at the operation. We manage to keep our production equipment in use 99 percent of its scheduled operating time. No. 1 mine has a capacity of 7,500 tons in seven hours. The production equipment consists of 50 electric locomotives of 15 types from five manufacturers (some built in 1907), 24 undercutting machines, 24 electric coal drills, 20 loading machines of three types, 24 miles of haulage system, power-producing equipment, etc.

Used for Larger Jobs

The following data and accompanying illustrations partly indicate the importance of welding in our daily maintenance work. Our biggest savings are made on the larger rebuilding jobs, such as the locomotive reconstruction described in the March *Coal Age*, p. 57, but in many smaller jobs the added life of the equipment and improved performance make welding well worth while even though the saving in initial cost may not be great.

One of our most valuable pieces of equipment is the portable welding and cutting unit shown in Fig. 1. Its true worth can be appreciated only after it has been in service a few days. With the many machines three miles or more from the shop to be serviced and repaired between shifts, and with time and one-half for all maintenance labor over seven hours per shift and 35 hours per week ($8 for a regular shift and $12 for an over-time shift of seven hours), this outfit becomes a real money maker.

Everything needed for cutting and welding, as shown in Fig. 1, is mounted or stored on the truck, and thus there is nothing to be forgotten. Equipment includes two fire extinguishers, red light, steel box for hose, gages, tips, etc., reel for welding cable, vise, locked box for welding rods, mask, goggles, and other auxiliaries. One welder and a helper on the night shift handle the numerous jobs on this shift with this outfit and today we wonder how we got along without it. Many places and parts, examples of which are shown in the accompanying illustrations, can be straightened and welded at the working face. Large chunks of coal weighing 3 tons or more often fall on a loading machine during operation, bending or breaking operating levers, guards and other parts and giving the welder a chance to "do its stuff." Welding also is permanent, as witness the job shown in Fig. 2, done in 1937 and still showing no signs of cracking.

Fig. 3 shows a repair job on a broken right side frame on a Joy 5-BU loader. A new side frame would have cost $190. To put it in, it would have been necessary completely to dismantle the machine at a cost of $85 for labor. And if drilling or riveting on a plate had been the choice, the labor would have been $105. By welding as shown in Fig. 3 the cost was $13.82, broken down as follows: labor, $11.50; welding rods and oxygen, $1.06; overhead, $1.26. To have installed a new frame or patched the old one by riveting would have required taking the machine out of service three 7-hour shifts. By welding, the machine was out one 7-hour shift, that being the night shift, when it was not used.

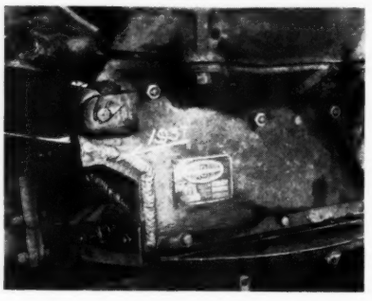


Fig. 2—Made in 1937, this weld shows no signs of cracking.

How Job Was Done

A patch over a spot that was wearing thin on the gathering head of a Joy 11-BU is shown in Fig. 4. This job took two men 2½ hours, including traveling time. Most of the wear comes at the point of the patch and by welding on a plate early the job is better and more easily done. The rest of the head, as shown in Fig. 4, is in good condition.

The point where the swivel-pot casting broke away from the braces marked *A* on a 11-BU machine is shown by the arrow in Fig. 5. The plate, indicated by *B*, was added to hold the casting at the bottom, and was applied at the face with the portable welder. No pot castings have broken loose since the bottom plates were added. Scrap plate is used and two men can do such a job in 2½ hours.

Numerous other descriptions of welding jobs could be added, but, since space does not permit, I am merely listing below others that come up every day. A story could be written about each, but the list shows

how indispensable is welding around a mechanical mine.

5-BU Joys

Cat. tread links recovered by welding.
Gathering curve bars recovered by welding.
New oil tanks built from scrap plate.
Worn shafts recovered by welding.
Broken and worn transmission cases reclaimed.
Broken pedestal frames repaired and reinforced.

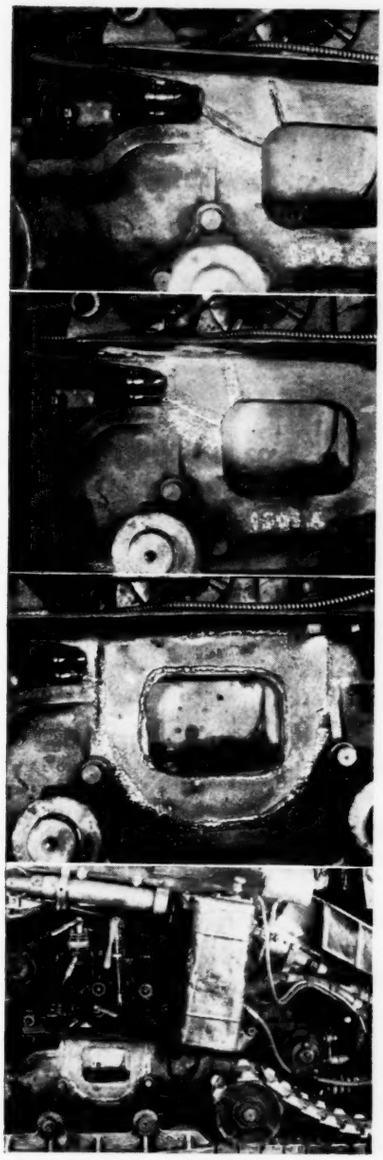


Fig. 3—Showing, from the top down, how break in side frame of loader was Veed out for welding; welding completed; addition of reinforcing plate by welding; extent of dismantling necessary.

Bumpers repaired and reinforced.
Gathering heads rebuilt and patched.
Rear conveyors rebuilt and patched.
Hopper guards repaired and reclaimed.
Jig for rebuilding cat. chains constructed.

11-BU Joys

Building up worn cat.-drive sprockets.
Building up worn brake drums.
Building up worn center-chain drive sprockets.
Building up worn gathering-arm brackets.
Reinforcing coal guards.
Reinforcing gathering heads.
Reinforcing rear conveyors.
Rebuilding gathering heads.
Rebuilding rear conveyors.
Building new steel bumpers to replace cast-iron bumpers.
Repairing center-chain rear rollers.
Reclaiming cat.-tread links.
Construction of jig for rebuilding cat. chains.

Locomotives

Repairing worn bearing housings.
Repairing worn field frames.
Construction of steel sand boxes to replace cast-iron and steel types.
Construction of all-steel bumpers from channels and plates.
Welding of sand riggings instead of pinning.
Construction and repair of pole brackets.
Recovery of reel-drum flanges.
Recovery of journal boxes.

Cutting Machines

Construction of oil cans from scrap material.
Construction of bit cans from scrap material.
Construction of tool boxes from scrap material.
Recovery of feed shafts by building up worn places.
Recovery of vertical shafts by building up worn places.
Cutter bars repaired.
Worn cutter-chain bit lugs recovered by welding.
Bits tipped with hard-facing material.
Bottom pans repaired by welding.
Trucks repaired by welding.
Construction of tongues to permit locomotives to haul cutting machines.
Spotting bolt heads to frame to keep them from falling in feed drum should heads break off.
Worn sheaves recovered by welding.
Broken cable guards recovered by welding.

Coal Drills

Drill heads and augers recovered by welding.
Guard pipes over thread bars welded.
Guard pipe castings reinforced with stress plates.
Worn armature shafts built up and machined.

Tools

Dozens of pinion pullers of all types made in spare time in shop.
Special wrenches.
Work benches.
Work jigs.

Fig. 4—Showing patch over worn place on gathering head of loader.

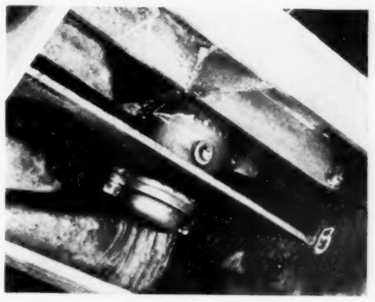


Fig. 5—Plate indicated by *B* was added by welding to hold swivel-pot casting.

Special trucks for moving generator sets.
Special trucks for unreeling and reeling trolley and feeder cable.

Trolley, Track, Miscellaneous

Worn trolley frogs built up by welding.
Worn trolley gliders, or shoes, built up.
Worn track frogs built up.
Broken 60-lb. rails repaired.
Steel- and copper-weld bonding.
Construction of special gadget to use with two 10-ton jacks to remove 30-, 40-, and 50-ft. poles set 5 to 7 ft. in the ground. One 30-ft. pole was removed from a 6-ft. hole in 20 minutes. Average time for removing 36 poles was 30 minutes each, including traveling time.
Construction of borehole cable clamp from junk material.
Construction of material bins from scrap.
Construction of typewriter stand with rubber casters. All material picked up. Looks like one from the store.
Construction of stand for flexible-shaft grinder, including drawers for wheels, sanding disks, special fitting wrenches, etc.

"MOGENTOR" MONITORS

Lower Coal Down the Mountain At New Poinsettia Conveyor-Equipped Mine

Now, when certain supplies and raw materials are no longer available to manufacturers of "luxury" products, they can realize that mining companies have always had to deal with the problem of depletion. Looking ahead seven years or so to the depletion of its Dean seam mine, the Block Coal & Coke Co. has opened a new mine operated on a fully mechanized basis. The monitor incline was rebuilt and reequipped to increase capacity and reduce maintenance, power and delays. To the original plant was added a four-track steel tipple.

By J. H. EDWARDS
Associate Editor, Coal Age

MODERNIZATION of all plant equipment and opening of a new conveyor operation, Poinsettia mine, has been completed by the Block Coal & Coke Co., Block, Tenn. Work on the mine was begun in 1937 in anticipation of the time (about 1943) when the Dean seam acreage, higher on the mountainside, would be depleted. A new steel tipple, new headhouse, new incline using three drop-bottom monitors with automatic regenerative control and braking, and new mine cars and other inside units are among the numerous improvements at the property, where mining began originally in 1903.

The Block Coal & Coke Co., under the management of W. G. Polk, Knoxville, president and general manager; John W. Howe, Jellico, general superintendent; W. G. Howe, Block, assistant general superintendent; and M. M. Haley, chief engineer, also operates Turley mine, two miles upstream from Block. The same group, in addition, manages the Tennessee Jellico Coal Co., some miles away in the same county, Campbell. The coals from the three properties, including "Poinsettia," from the new mine, are sold by Walter Bledsoe & Co. Stuart, James & Cooke were consultants on Poinsettia modernization.

Although the coal in the new mine is practically free of partings and yields a high-grade product, its thickness range of 14 to 40 in., averaging 30 in., limited the earlier mining to a small acreage and to irregular development in search of thicker areas. At the headhouse the seam is 1,125 ft. higher than the monitor tracks at the railroad tipple dumping bin. To serve also to complete the mining of the Dean seam, 350 ft. above the Poinsettia, the new incline machine was permanently installed at the top, 1,465 ft. above the tipple.

Average grade of the incline is 18½ deg., or 33 percent. The track is laid with three rails above the passing point and two rails below. Construction is 90-lb. rail on 6x9 oak ties. Monitors are uncoupled from the 1¼-in. main rope at the bottom of the incline at a point on a 1.6-percent grade leading to the tipple, over which they are handled by a single-drum hoist fitted with a ⅝-in. rope. As the empty monitor is pulled back toward the foot of the incline it switches to an empty track, where the ⅝-in. rope is unhooked and the monitor is allowed to drift to a low point ready for the next hoist. Monitors weigh 12 tons each and the maximum coal loading is 10 tons. They are the Sanford-Day four-door standard-gage drop-bottom units with chilled Timken-bearing wheels.

Link-Belt furnishes the incline retarding machine complete with a 300-hp. General Electric Type MT wound-rotor induction motor, 6-in. "Thrustor" band brake, flyball governor (Logan Engineering Co.), contactor controls, cam-operated master switch, ammeter, watthour meter and electric tachometer. Total weight of this equipment is 60,000 lb. Drive and idler drums are 7 ft. 8 in. in diameter, cast-steel construction; the brake drum, 8 ft. 4 in., "Hi-Test" cast iron. Shafts are mounted in Link-Belt "Friction-Fighter" roller bearings. The coupling between motor and machine is a No. 5 torque-ring flexible unit (J. Waldron Co.).

The 300-hp. motor, which in this duty serves as both motor and generator and which this writer elects to label a "mogentor," operates at around 600 r.p.m. (synchronous speed), and the rope speed is 1,350 f.p.m. when lowering at full load. At 15 percent overspeed the governor opens contacts which cut power from the motor and "Thrustor," thus setting the brake. The operator, stationed near the upper seam monitor terminal, controls the monitors by one cam-operated master switch. Power regenerated by the electric braking is returned to the 2,300-volt line and for the most part is utilized in driving substations and other equipment, thus reducing the purchased-power bill. For more technical details of the controls, see p. 83 of this issue.

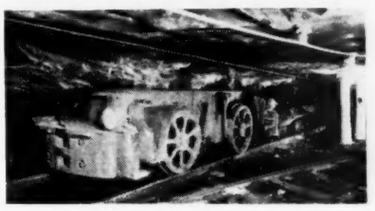
As compared to the mechanical braking used on the replaced equip-

ment, the regenerative braking system also saves in brake-lining maintenance cost and makes for safer operation. Another duty of the "mogentor" is hoisting men and materials on the same incline. Monitors have back platforms with railings and handholds for men.

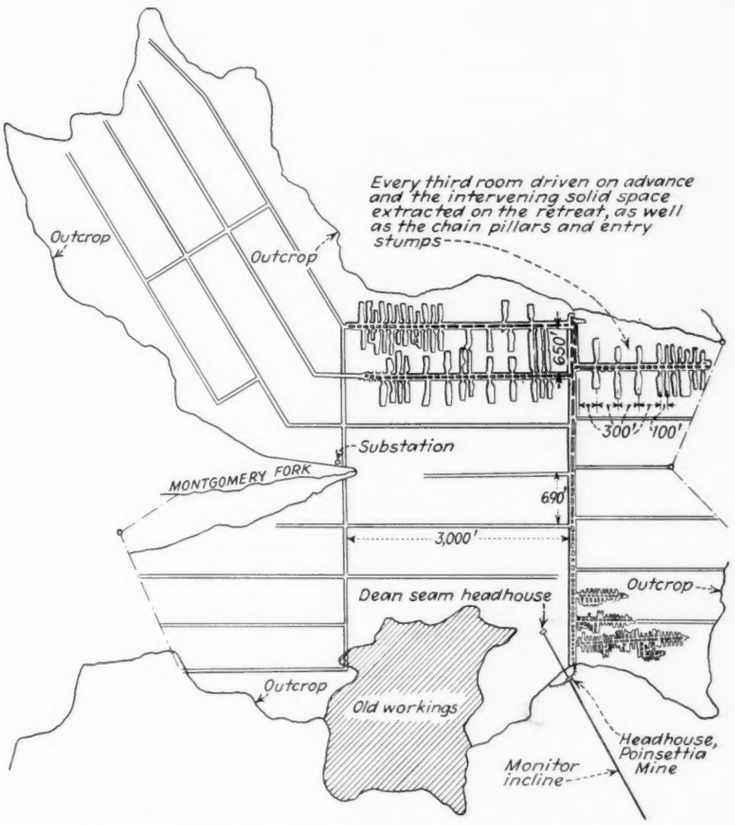
Unhooking the monitors on the 1.6-percent downgrade at a point 450 ft. from the tipple dump bin has several advantages. Length of the main rope is less; this rope is spared some of the wear against vertical rollers it otherwise would experience; slower speed is possible and there is better control of the dumping operation.

Poinsettia has been equipped with 75 new all-steel cars with "S-D Floater" chilled ball-bearing wheels. Tare weights are 3,500 and 3,700 lb. (two types), and the capacity, conveyor loaded, is 3 tons. The bin into which these drop-bottom cars discharge holds 100 tons. It and the trestles at each end for loaded and empty cars are all-steel. Cars are weighed just outside the drift mouth on a Streeter-Amet scale with automatic weight indicator and recorder.

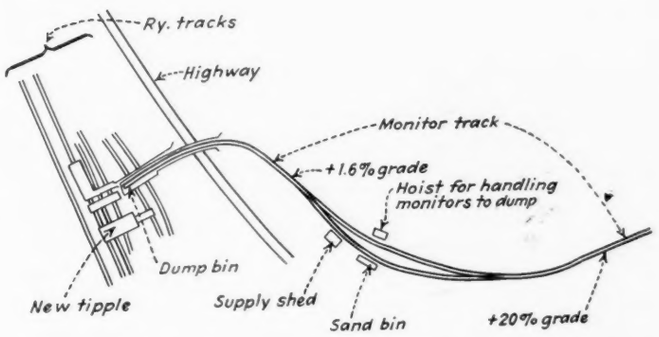
Capacity of the drop-bottom monitors is 10 tons.



A 20-car trip on the way out.



Poinsettia mine—the portal is close to the monitor headhouse and 2,425 ft. above sea level.



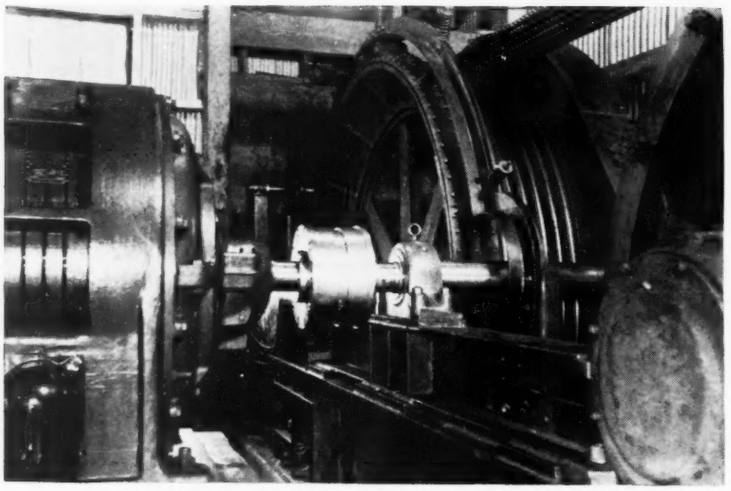
At the foot of the incline, monitors are uncoupled and then handled by a hoist over the 1.6 percent downgrade track to the tipple.

Distance from drift mouth to headhouse is 300 ft.

Development and production in Poinsettia mine, under the foremanship of J. W. Fuller, is based on eight conveyor units, each consisting of a 300-ft. 61-AM room conveyor, 40-ft. HG face conveyor, A-7 hand-held drill and a shortwall cutter. Two of the units have 61-EW elevating conveyors. All conveyors and drills are Jeffrey. Of the eight cutters (one is a spare) four are Jeffrey 35B 35-hp. units, two are Jeffrey 35L 35-hp. machines, one is a Sullivan 9B 20-hp. unit and the other a Sullivan CE7 35-hp. machine. Conveyor motors are controlled by Ohio Brass Type KAD starters.

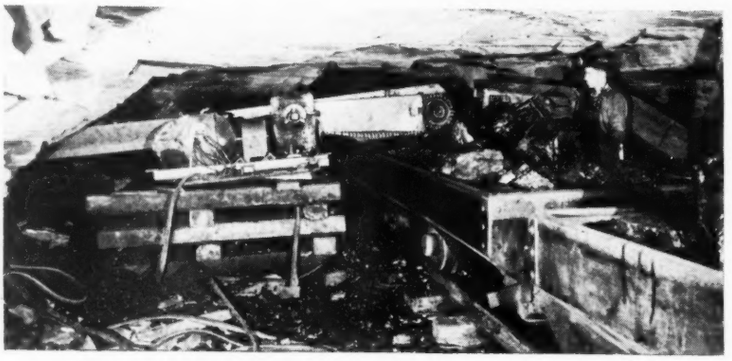
The mine is developed in panels 3,000 ft. long. Rooms 325 ft. deep are driven both ways into the 650-ft. blocks off these panel entries. Room width is 40 to 45 ft. and when it is completed the face conveyor is transferred to the opposite and an equal width is mined out of the pillar on the retreat. Two room conveyors from opposite sides discharge to the same car, one directly and the other via an elevating conveyor in the chain-pillar crosscut. The rooms (completed width 80 to 90 ft.) are driven on 100-ft. centers. Every third room is driven up on the advance into the panel and then the other rooms and the chain pillars are mined on the retreat.

Entries driven by conveyors consist of a 15-ft. haulway and a 25-ft. aircourse on 40-ft. centers. Haulways are brushed to 6 ft. but no top is taken in the aircourses. Room necks are 15 ft. wide and rooms from adjacent panels are extended until they cut together. The top is mostly a firm slate, although slips are present. In

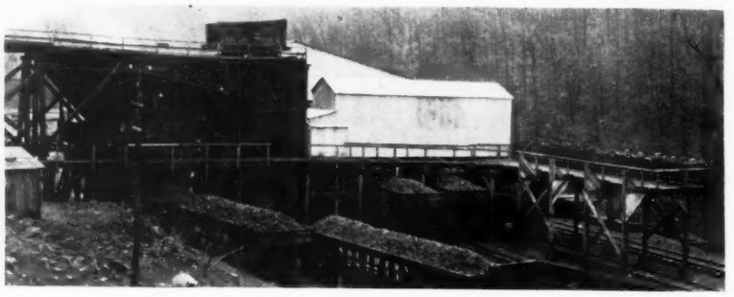


New machine, coupled to a 300-hp. "mogentor," has anti-friction bearings.

Two men load on face conveyor while third saws a prop.



One room conveyor discharges directly to the car and the other via an elevating conveyor through a break in the pillar.



The arrangement of twelve 1-ton portable buggies for locomotive coaling (right) was not disturbed in the new construction.

the territory now producing, these slips are parallel to the room, or panel, entries. Rooms usually are posted on 4-ft. centers each way but the timbering is varied according to conditions. Cover ranges up to 600 ft.

The mine is worked three shifts and the coal is shot with 1⅛x6-in. Atlas Coalite O permissible sticks. In the section where the accompanying underground pictures were made the seam is 36 in. thick and is clean except for a ¼-in. band 6 in. down from the top. Mine production has now reached a peak of 1,000 tons per day. The tipple is operated two shifts.

Mine-rail weight is 60 lb. Bonding is done with Ohio Brass long-type steel arcweld bonds. Line materials (350,000-cir.mil grooved trolley wire), including trolley hangers, clamps, frogs and safety feeder switches, also are Ohio Brass. Poinsettia mine has two 275-volt d.c. substations. One, at the drift portal, is a 150-kw. Stanley converter with a new General Electric Type AD-1 1,200-amp. automatic d.c. feeder breaker. Another converter, a 150-kw. Westinghouse machine, is located in an outside substation at crop elevation on Montgomery Fork 6,000 ft. distant by d.c. connection. Design of the field-stone building for this substation is described on p. 84 of this issue. A third 100-kw. substation in the Dean seam is operated in parallel with the two Poinsettia substations.

Sizes Now Are Being Made

Until 1940, when a new steel tipple furnished by the W. J. Savage Co. was built at Block, all of the production had been shipped as mine-run. The original three-compartment monitor dump bin that served also as a tipple was left intact except that from one compartment a reciprocating feeder was installed to feed a drag conveyor delivering to the shaker screens of the new plant.

The new all-steel plant spans four loading tracks and has three apron-type loading booms. A belt conveyor extends back to a double-discharge car-changing chute on one of the original loading tracks. The design provides for a possible future crusher and a mixing conveyor at the ends of the booms. For coaling Southern R.R. locomotives the original and commonly used arrangement, consisting of a platform and twelve 1-ton self-dumping push buggies, is continued.

Other new buildings at the mine include a bathhouse, maintenance shop and lamphouse. Lamp equipment consists of 150 Wheat lamps, Models G and W.

EXPERIMENTAL PLANT

At University of Iowa Produces Excellent Stoker Fuel From Iowa Screenings

By H. L. OLIN, HAROLD BICE, WALTER J. ARMSTRONG, and DONALD R. DOUSLIN

University of Iowa, Iowa City, Iowa

STUDIES made at the laboratories of the University of Iowa, Iowa City, Iowa, show that an excellent stoker fuel can be made from the coals of that State by the use of preparation equipment. Figures on the sale of mechanical stokers released by the Bureau of the Census show that in the first eleven months of 1941 a total of 183,796 units of all types and sizes were sold, an increase of more than 25 percent over the number sold in the corresponding period in 1940, when 146,243 unit sales were reported. This revolutionary trend in domestic heating that may be accelerated in the near future by possible advances in fuel-oil prices presents to the Iowa producer the difficult problem of providing the discriminating consumer with a satisfactory domestic stoker coal.

The Iowa producer is mentioned particularly because in Iowa alone, of all the bituminous coal-producing states of the Middle West, the practice of coal washing has been neglected; here, the uniformly sized, low-ash coal demanded for stoker use is produced, so far as possible, by screening operations alone without the powerful aid available in the water classifier. Conditions of this kind have to a large extent shaped the policies of the coal-research staff at the university, and, to establish limitations and possibilities for future application to Iowa practice, its laboratories have made studies with various types of machines for some years.

Before undertaking operations with pilot machines, a broad groundwork was laid by plotting as washability curves data obtained from float-and-sink tests made on coals from most of the important producing mines of the State. Fig. 1, based on data obtained with coal from a Mahaska County strip mine, is a typical example. Such a plot, accurately drawn, indicates the theoretical limits of separation under various conditions and serves as a basis for computing actual washing efficiencies. Thus, given a point on the specific-gravity curve corresponding to the density of the float liquid, the theoretical float yield may be read as an ordinate point on the left and the average ash content of that fraction from the cumulative ash curve. The setting of the machine for obtaining the desired cut becomes then a matter of adjusting the pitch of the table deck and of regulating the coal feed and water flow so as to duplicate the float-and-sink result for the given conditions.

Experimental equipment of the table laboratory includes a Deister-Overstrom No. 14 table with linoleum deck fitted with riffles fashioned for coal sizes below 1 in.; an automatic screw-conveyor feeding device designed and made for the university by the Link Belt Co.; a Sturtevant burr mill set to deliver a feed coal of 1 in. maximum, and a steam-heated tray dryer with induced-draft circulation. A wedge-wire dewatering screen was available, but, because of present space limitations, its installation has been deferred and a drainage sump

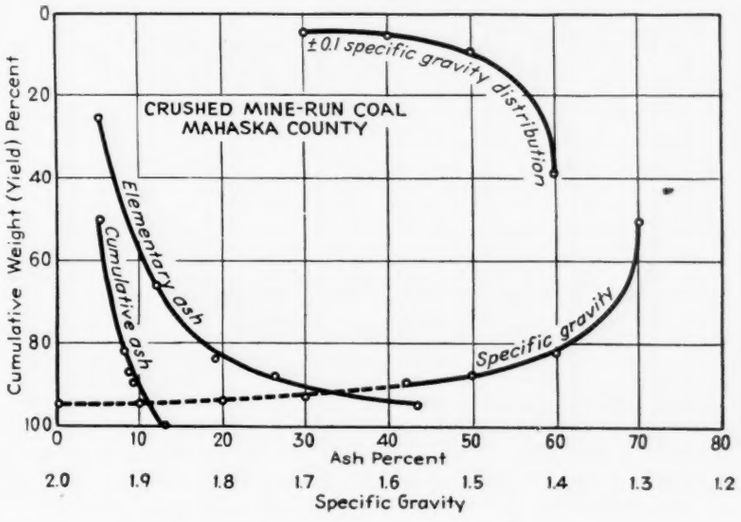


Fig. 1—Typical float-and-sink plot of Iowa coal.

has served as a temporary receiver for the float product.

Test runs were made on raw-coal lots of about 1.75 tons crushed to 0.75 in., which for the conditions and equipment at the laboratory proved to be the optimum size. In general, feed size must be governed by a consideration of the nature of the impurity and the intimacy of its distribution through the lump. If shale or pyrite is present in the form of a parting, separation in the mass is easily effected, but only relatively fine crushing can insure high cleaning efficiency when the heavy minerals are disseminated in small particles.

Fig. 2—Refuse and domestic-stoker coal from Iowa screenings.

Table I—Table Cleaning of Mahaska County Screenings

(Percentages on dry basis)

	Dry Weight Lb.	Ash Percentages	Percentage Yield	Sulphur Percentage	Thermal Value B.t.u.
Raw feed	3,638	11.66	....	7.02	12,397
Product	2,964	7.10	81.5	6.01	12,990
Middlings	67	21.00	1.84	....	.....
Refuse	426	41.20	11.72	....	.....
Water-sump fines	158	14.71	4.34	....	.....
Percent loss	0.62	....	....	....	.....

Feed rate, 0.78 ton per hour.

Table II—Table Cleaning of Mahaska County Crushed Mine-Run

(Percentages on dry basis)

	Dry Weight Lb.	Ash Percentages	Percentage Yield	Sulphur Percentage	Thermal Value B.t.u.
Raw feed	3,347	11.60	....	6.69	12,357
Product	2,841	8.14	84.90	4.15	12,731
Middlings	45	16.70	1.34	....	.....
Refuse	328	39.60	9.80	....	.....
Fines	109	12.31	3.24	....	.....
Percent loss	0.73	....	....	....	.....

Feed rate, 0.76 ton per hour.

Table III—Repreparation of Oiled Stoker Coal

(Percentages on dry basis)

	Dry Weight Lb.	Ash Percentage	Percentage Yield	Sulphur Percentage	Thermal Value B.t.u.
Raw feed	3,101	12.52	....	7.86	12,434
Product	2,615	8.78	84.32	5.48	13,037
Middlings	160	12.56	5.16	....	.....
Refuse	296	38.80	9.55	....	.....
Fines	0.00	....	....	....	.....
Percent loss	0.97	....	....	....	.....

Feed rate, 0.63 ton per hour.

Table IV—Salvage Tests on Picking-Table Refuse

(Percentages on dry basis)

	Dry Weight Lb.	Ash Percentage	Percentage Yield	Sulphur Percentage	Thermal Value B.t.u.
Raw feed	3,114	20.60	....	10.06	10,998
Product	2,267	11.88*	72.80	3.45	12,226
Middlings	66	31.35	2.13	....	.....
Fine refuse	456	50.50	14.64	....	.....
Heavy refuse (pyrite)	145	60.00	4.64	....	.....
Fines	180	13.91	5.78	....	.....
Percent loss	0.30	....	....	....	.....

Feed rate 0.92 ton per hour.

* By setting the machine to produce a 60 percent yield, a product of 9 percent ash may be obtained.

Typical washing results are given on four types of raw stocks from a Mahaska County strip mine: (1) ordinary 1¼-in. screenings normally sold as power-plant steam coal; (2) crushed mine-run, produced in the summer season to substitute in part for the reduced supply of screenings; (3) an oiled stoker coal put out by this company for its domestic trade, and (4) refuse from the plant-picking tables collected in course of coal preparation at the tipple. Data on the washing of screenings are shown in Table I. Visual evidence of the improvement effected is provided by Fig. 2.

Crushed Run-of-Mine

During the warm season, when the domestic demand for the larger graded sizes is low or nonexistent and screenings are scarce, Iowa producers usually supplement their shipments on year-round power-plant contracts with crushed run-of-mine. It is in general superior in quality to straight screenings, but the degree of difference varies widely with mine and preparation plant. Table II presents the results of one of a series of tests of this type of fuel obtained from the regular university supply.

Table III summarizes the results of a test run on a stoker coal marketed in Mahaska County for domestic use. Except for an application of oil to make it dustless and to remove bug-dust, it has much the same quality as the crushed mine-run. It was obvious, however, in the washing operation that the oil added promoted a sharpness and completeness of separation not observed with any of the untreated coals. It seems evident that the oil film preferentially absorbed by the coal particle inhibits wetting much as it does in froth flotation and with the same beneficial results. Particularly noticeable was the clearness of the waste water, which carried mainly a light clay suspension instead of the black turbidity due to wetted coal fines. Much of the oil applied before the coal was cleaned on the table remained in the product; it is possible that in cases where separations prove unusually difficult a light oil pretreatment will prove effective and economical.

Of special interest in this series of

studies were the results obtained in tests of material rejected at the picking tables and normally wasted. Mechanical loading in any situation increases the burden of the cleaning plant but in stripping operations the necessity for removal of gross impurities becomes especially acute. The obvious solution of the problem in a completely equipped plant, of course, is a rigorous separation at the picking table followed by the crushing and washing of the rejects; without the follow-up operation, picking resolves itself into a nice question of concession to the quality of product on the one hand and loss of valuable tonnage on the other. It is the usual practice at this mine to reject from 9 to 10 percent of the gross delivery from the pit; much of this refuse is unsalvaged.

Table IV sums up a typical test run on this material crushed down to 0.75 in. It shows a yield of more than 70 percent of a product of less than 12 percent ash, which is qualified by uniformity of size, freedom from dust, and moderate ash and sulphur contents (comparative standards at least) to hold its own with other stoker fuels produced in the State. The economic importance of reducing the quantity of net waste from the tables, of course, is too obvious to need comment.

Confidence in the value of these products as stoker fuels is amply supported by burning tests made under practical conditions in one of the university cooperative dormitories equipped with a Kol-Master domestic stoker. Though equipment is available for making formal heat balances, attention has been centered mainly on the qualitative aspects of the nature of the clinker formed, the coking and burning characteristics of the coal, and ease of control of the combustion process in general. In the latest studies, about 10 tons of the fuel types described in this paper were used, in addition to prepared coals from other states which served as reference material.

With ash-fusion temperatures of the coals tested ranging from 1950 deg. to 2080 deg. F., no difficulty was experienced in obtaining well-fused, noncrumbling clinkers easily handled with the tongs. Many of them were large, weighing up to 8 or 10 lb., but they were invariably deposited on the dead plate well out of the combustion zone. Iowa coals are free-burning, but, contrary to general impression, they possess marked coking properties, and some attention to prevention of coke "trees" was necessary. But troubles with coke formation are common to the burning of all bituminous coals; from this viewpoint the relatively low coking index of the coals from Iowa is an asset. Perhaps the best proof of its general quality is that the furnace attendant voluntarily afforded it his enthusiastic indorsement.

Because of its relatively low capital cost, the table cleaner holds special promise for the small producer whose output goes mainly to the domestic market, and a number of units are in operation in Illinois, Missouri and Arkansas to supply such a need. In Iowa, with its 390 odd mines, most of them small, lies an opportunity for the forward-looking mine operator to meet the quality standards set in neighboring states. Meanwhile the stoker has come to stay, and the Iowa domestic consumer is learning things about coal and where he may find the kind he wants.

NEW AIRSHAFT

At Old Ben No. 8 Mine

Embodies Modern Ideas in Construction

COAL MEN have become used to mechanized mining, but mechanized shaft sinking is something different. Old Ben Coal Corporation, however, recently had a new airshaft manufactured for its No. 8 mine, at West Frankfort, Ill., by the Dravo Corporation, Pittsburgh, Pa. Concrete-lined from top to bottom, the first 78 ft. of the shaft, down to hard material, was of caisson form of construction. The methods used make the sinking and lining of this 78-ft. section of particular interest, in addition to the fact that the coal miners stuck to the job of getting coal while the construction specialist was at the task of sinking the new airway to their working places.

Instead of using equipment picked up here and there from the coal company's inventory the construction apparatus employed was part of the contractor's stock in trade. It consisted of blacksmith shop, woodworking tools, a set-up for bending steel reinforcing rods, combination sand and crushed-stone bin with a weighing scale underneath, a concrete mixer and a revolving crane with clamshell bucket. The crane is track-mounted so that every part of the area may be reached, for this unit does the earth excavating besides handling concrete materials and forms.

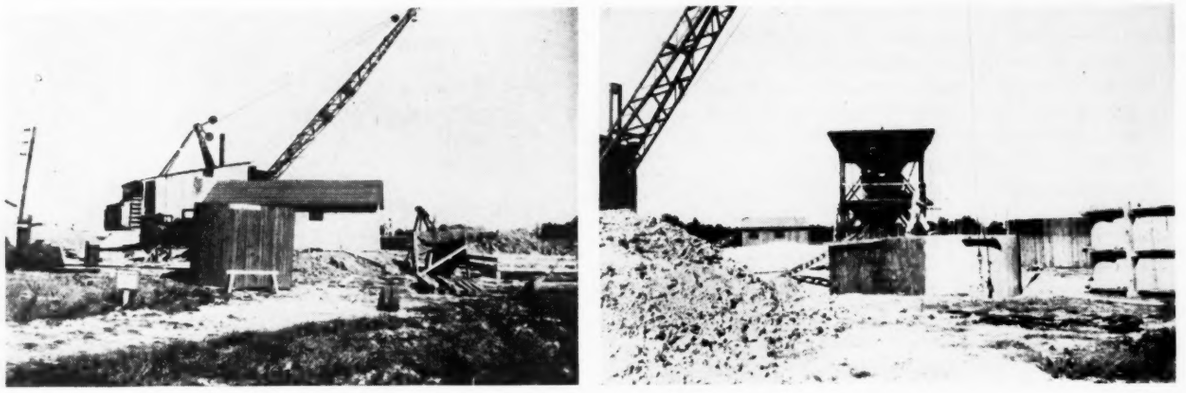
The wooden forms were constructed on the job. The sides and ends were bolted together for ready removal from the hardened concrete. When reassembled for a new concrete section, however, the crane lifted the whole form bodily and set it in place on the

supporting blocks. These supporting blocks then were bolted at the top to the outside of the section that was last to be poured.

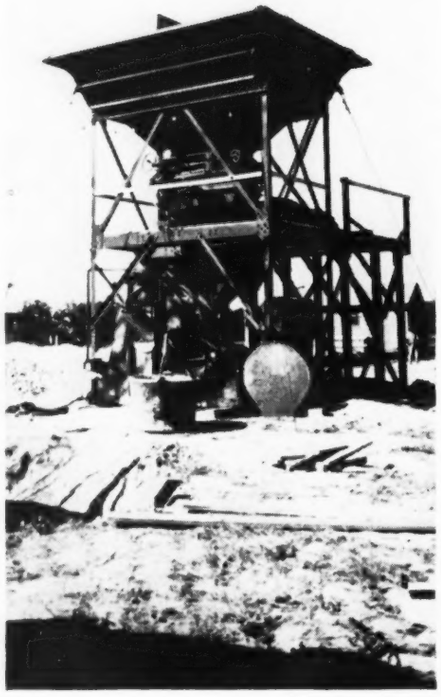
With the construction method employed each new section was added above ground, then the inside of the caisson was excavated and the new section allowed to sink of its own weight. To reduce friction between the concrete and the earth, the outer surface of the caisson was painted with durocroux, which made a smooth, glossy finish. The caisson was kept plumb by excavating at the lagging end or side.

The concrete formula is 1:2:3 of cement, sand and rock. Steel reinforcing rods of both round and square cross-section were used. There are two rows of 1-in. round rods set vertical, a few inches inside outer and inner surfaces, 2 ft. apart in the outer row. Horizontal rods are spaced 6 in. from inside to outside. In various sectors of the caissons these rods are 1¼- and 1-in. round and 1-in. square.

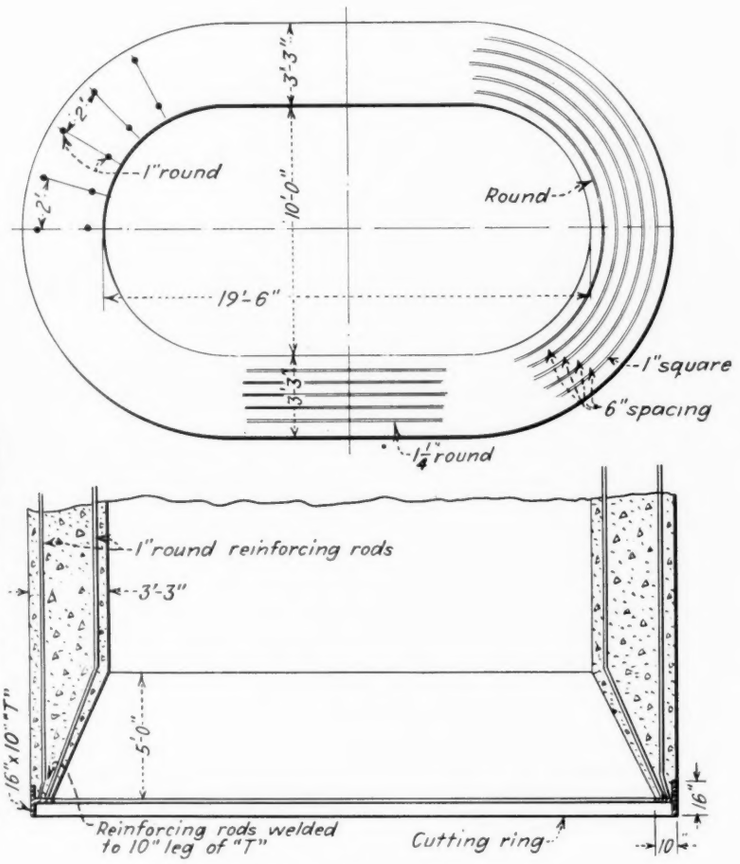
The cutting shoe was made from a 16x10-in. "T" with ½-in. webs; the 16-in. dimension is vertical and the 10-in. leg turned inside. All vertical reinforcing rods are welded to this ring. General dimensions of the caisson are shown in the drawing. Old Ben's distribution system furnished the power.



Left: Inner form (foreground); right: concrete lining ready for forms; supporting blocks on side and end, inner and outer forms at right.



Sand and crushed-stone bin with scale; concrete mixer in front.



Horizontal and vertical cross-section of caisson.

[SECOND OF TWO ARTICLES ON BRITISH COAL LABOR TROUBLES]

MEASURES TAKEN IN BRITAIN

To Combat Absenteeism, Listless Work And to Reestablish the Force at the Mines

By J. E. NORTON
Assistant to the President
Pittsburgh Coal Co.

LAWS were passed in Great Britain to compel men to remain in their industrial occupations, forbidding employers to discharge men except for cause, and giving power to a tribunal to enforce this order without right of appeal. The miners' union agreed to these provisions, but obtained for its men a guaranteed wage and a wage increase. Pit production committees were formed having power to fine men for absenteeism, sleeping on the job and behavior reducing coal production. Finally, on June 24, 1941, the "age of reservation" for coal miners was lowered, and July 1 non-industrial users were limited to a ton of coal a month. Tens of thousands of men were compelled by law to return to the mines.

Early in the course of the war, mine labor in Great Britain was irregularly employed. Inadequate storage, lack of transportation facilities, and the loss of foreign markets made operation uncertain. But in March, 1941, the coal fields were unable to produce enough coal to meet the national demand, and Parliament was compelled to take drastic action.

Toward the end of March, 1941, renewed pleas were made in certain areas to prevent miners from being taken by the draft into the armed forces of the nation, but these declarations were countered by arguments that absenteeism was rife, that production per man was low, that miners were unwilling to work hard or for full working time or to earn wages that would result in the payment of an increased income tax.

In view of these facts, the government was unwilling to release men from the army or to lower the age of reservation from induction into the fighting services. Not until June 24 of last year did the government finally lower that age limit for coal miners. At this period, it directed patriotic appeals of two sorts: (1) to ex-miners engaged in other industries urging them to return to their former occupation and (2) to miners to produce their utmost and to attend work regularly.

In the spring of 1940, Parliament passed the Essential Works Order, which was one of the most stringent pieces of legislation ever applied by a democratic nation for the control of industrial labor. It provided that essential workers should be compelled to remain in their industry; it allowed employers to dismiss employees only for cause; it guaranteed wages, and established National Service Officers to administer the order and provided that from their decision no appeal could be made. About the middle of April this order was applied to the coal-mining industry. The colliery owners, the Joint Consultive Committee, the Mines Department, and the Mine Workers' Federation agreed jointly on certain provisions to be incorporated to make its application effective in coal mining.

In consideration of their willingness to accept the plan, the Mine Workers' Federation, along with other demands, asked for a guarantee of six days' work weekly, the abolition of non-unionism and an increase in wages. After about a month of discussion an agreement finally was reached which gave the miners a wage increase of 1s. 6d. (30c.) per shift (on the basis of $4.04 to the pound sterling), a guaranteed wage of four pounds ($16.16) a week and a bonus of 1 shilling (20c.) for each day worked, payable only if the person receiving it answered every call during the week. It also included the establishment of a Pit Production Committee at each mine. This was a joint committee of management and labor authorized to deal with all matters affecting production.

The Pit Production Committee, under the Essential Works Order as applied to coal mining, had the legal right to fine for such offenses as absenteeism, falling asleep on the job and any behavior which tended to reduce the production of coal. The Essential Works Order as applied to coal mining became effective June 9, 1941. It also provided for the acceptance of the principle of the six-day week. In this, of course, the union made a great concession. The 7½-hour day was unchanged. Through his power to issue regulations under the Essential Works Order, the fate of the industry now rested in the hands of the Minister of Labor and National Services, Ernest Bevin.

Steadily throughout May and June, demand for coal increased. To everyone, including Mr. Bevin, it was clear that less coal was being produced than would meet the needs of the nation, almost entirely because of the lack of manpower. Yet Bevin, who

had the power to act, was hesitant, because Britain needed its army, and those miners who had gone into other industries had been trained in new skills and now drew much higher wages.

Application of the Essential Works Order to coal mining effectively stopped the exodus of miners, and by the end of June no more men were being called up for the service except such young men as volunteered for the air force. Messrs. Bevin and Grenfell made stirring appeals to the patriotism of ex-miners to return to the mine, asking 50,000 men to join the 690,000 already at work. The Bevin War Cabinet refused to release men from the army or even, as some suggested, to furlough them for the summer, while coal demand and improved transportation facilities made the pressure lighter than could be anticipated during the cold winter months and when stocks therefore could be replenished.

However, after the debate in Parliament on March 17, the Cabinet climbed down and consented to release a small number of men temporarily for the express purpose of replenishing the face personnel, which has been one of the most serious problems confronting colliery managements. A few young miners have been released; how many it is impossible to state.

To Mine "Easy Coal" Only

The following quotation from an editorial in the *Colliery Guardian*, June 27, gives a strong hint of one of the drastic measures: "As in 1916, all development work is to be stopped in the mine, and efforts should be made to concentrate upon seams from which rapid results can be expected. Here again it is no use complaining, although past experience tells us that the consequences of taking the cream off the coal may be very serious when the era of reconstruction is reached, and there appears to be pressing need for effective financial guarantee that the future of the industry is not to be compromised beyond redemption. It may be possible to make timely provision without evading the immediate pressure for output."

On June 24, the government finally lowered the ages of reservation for coal miners, although the application of the Essential Works Order, through the establishment of the National Service Officers, was to a large extent effective in accomplishing the same purpose.

On July 1, 1941, strict limitation to non-industrial users was put into effect. They were limited to one ton per month, except under special license. Even that single ton was not guaranteed, unless the supply was adequate. Mr. Grenfell loosed a barrage of appeals for the conservation of fuel by every possible means—even to recommending that pots be scraped free from the scale which too often hinders effective heat transfer. Mr. Bevin appealed to other industries to furlough ex-miners, promising to return them at the end of the summer season.

Union Opposes Works Order

In July, the Mine Workers' Federation of Great Britain met and, although it opposed the application of the Essential Works Order, it was "deemed unpatriotic to take any step about it . . . and it would take some very decided measures, such as a strike, to bring about reconsideration." This attitude was an instance of rank-and-file opposition to the actions of its leaders (who indeed made caustic reply to their critics). The main objection of the men was directed to the attendance bonus which had been offered voluntarily by the owners as an inducement to secure regular attendance. As an instrument for that purpose, it was emasculated in two stages; first nearly all the penalty clauses were cut out under pressure from the miners and then the bonus was to be withheld only on the days on which the absence occurred instead of being applied to the whole week of which that day was a part.

The production obtained in April and May was estimated at 4,000,000 tons per week instead of 4,500,000 tons, which had been set as a target for the summer months. There was no evidence that it would be reached unless other measures were taken to insure positively the return of more men to the mines. The *Colliery Guardian* estimated that production was about 18 percent below a reasonable capacity, about 13 percent of which was due to a lack of man-power and 5 percent to absenteeism. The actual production during this period is, of course, not available.

On July 17, 1941, to get more men to return to the mine, persuasion having failed, compulsory registration of ex-miners was begun. All men with mining experience between the ages of 20 and 60, with six months' experience or more since 1935, were required to register.

About 100,000 men were listed, of whom 25,000 expressed a willingness to return to the mine. Within two weeks, 6,300 reported for duty. Of these, 4,000 were face workers. In Parliamentary debate on Aug. 5 Mr. Grenfell said about 100,000 men had left the industry since the war began, 75,000 of these during the preceding twelve months.

In the course of the debate, several members dwelt on the shortcomings of the registration plan, although it should have been apparent that no such large-scale scheme could conceivably match up, job by job and mine by mine, the man-power requirement of the coal industry without considerable margin for error and confusion. By the end of August, it was anticipated that 40,000 ex-miners were returned to the pits; 15,000 men came voluntarily and the other 25,000 were weeded out from other industries, at the direction of the Minister of Labor. Thus, the Essential Works Order had a reasonably satisfactory result.

As could have been foreseen, a proper geographical distribution of talents was not always attained; many of the returned men were physically unfit, some were men who previously had been rejected; a minority were disgruntled as, in returning, they suffered losses in earnings of £2 ($8.08) per week and more. But, despite these difficulties, 27,540 men returned between June 18 and Nov. 17; about 50 percent of these, fortunately, were face workers, as against a normal working force ratio of about 35 percent. The treatment, though drastic, therefore was effective. Instances are cited where men were fined severely—as much as £25 ($101.00)—for refusing to return to the mines. In other cases, men were fined for refusing to work on the jobs assigned them.

Study Personnel Problems

The need for coercive measures to get men to return to coal mining evidently caused the industry to take stock of itself and raised in its mind the question, Why? Earlier in the year, some scattered efforts had been made to encourage more training programs for young men, but the results either were short of expectations or the recent developments had betrayed the unsavory opinion held of the industry. For this reason, more attention began to be given to personnel problems. Technical training courses of six months' duration were established in the technical schools, and industrial leaders, in their speeches, made more frequent reference to the problem.

Undoubtedly a strong contributory factor to the feeling that all was not well was the constant friction between

management and labor, yet the Pit Production Committees had given labor an equal voice with management in all labor problems affecting output. In the middle of October, the government decided to pay each member of the Pit Production Committee 3 shillings (about 60c.) per meeting with the intention of creating the feeling that they were acting as government agents rather than representatives of their particular group.

These committees could either assess a fine or refer recalcitrants to the National Service Officer, who had legal power to order a prosecution. The system has caused much grumbling; these officers are mainly Labor Exchange officials and have no knowledge of mine conditions, yet have very arbitrary powers; moreover, they can force men on the managements, overriding objections raised as to physical condition or competency. Recently, the Pit Committee has been invested with larger power to settle cases without reference to the National Service Officer, but there is a fairly general complaint that the time of managers on these committees, ostensibly created to deal with technical production problems, is wasted on discussion of trade-union questions.

Five Wage Increases

Labor had attained a guaranteed weekly wage. It had received five increases in wages since the outbreak of the war in September, 1939, and in September, 1941, it obtained a sixth when it managed to convert the attendance bonus to a flat daily increase. The six increases aggregated 3s. 8d. (74c.) per day.

Labor had managed to whittle down the Orders, yet for a nation at war the record is not good, as reference to the following table will indicate:

	No. of Strikes	No. of Workers	No. of Working Days Lost
1940—8 months March to October	220	137,000	366,000
1941—8 months March to October	306	104,200	234,000

Among the persistently occurring demands were higher food rations, change from the canteen-at-the-mines system to additional general-use food coupons to allow wider choice of foods, advance of payday from Saturday to Thursday to coincide with store-stocking days, because rationed goods were sold out by Saturday; 100-percent unionism, lengthening of lunch time, etc.

Higher Wage, Less Work

The most serious problem to the operators aside from shortage of men, was absenteeism. No effective means could be found to decrease these unnecessary absences. One colliery went on a five-day week, but the miners showed up on the sixth day and demanded full pay. Patriotic posters, radio addresses and speeches were tried. It is doubtless true that most of the men were hard-working and loyal, but there was a minority which, if it had done its part, would have bridged the gap between shortage and sufficiency.

Early in the year, the government had begun to establish food canteens at heavy-industry plants. In most cases, the men had to pay for their food, but they were able to get rations at these canteens in addition to those allowed under the national rationing scheme. Coal miners were included in this canteen plan. The Mines Department issued a statement by the end of August that 252,000 miners were being served and that plans were in operation to take care of another 318,000.

Early in October, it was stated in Parliament that the government expected by the end of the year to have provisions made for 85 percent of the underground workers. Plans were prepared for an additional 8 percent. Supplementary clothing ration tickets were being issued to the miners. Because of government censorship, production figures cannot, of course, be obtained, but the statements from the responsible government officials indicated that the supplies, though somewhat more than adequate for immediate needs, were far short of the requirements of the winter stocking program.

Early in October, the "Coal Supply Order" was issued which required colliery managers to take orders on shipments from the Secretary for Mines. This was superimposed on a priority system, and its effect was that the colliery managers were obliged on request to make shipments to certain consumers. Naturally, the purpose was to insure essential industries against a coal shortage.

In November, Secretary for Mines Grenfell said that the government was attempting to stock as much coal as possible, but a shortage of track materials and stocking machinery was hampering its efforts. Prime Minister Churchill said good grounds exist "for the belief we should come through the winter all right—without having deranged our army—". This was his indirect way of saying that he hoped there would be adequate supplies for the 1941-1942 winter needs and that more army men would not have to be sent back to the mines.

Abstain From Use of Coal

Toward the end of November, utility companies on their own initiative and at their own expense issued and collected pledges from the householders asking for their cooperation in conserving coal, coke, electricity, gas and oil.

Though the condition at the end of the year could not be described truthfully as satisfactory—there were intermittent shortages, strikes and transportation troubles—yet a succession of control measures had brought about a degree of order which, despite administrative lapses, could not, as at earlier periods, be properly described as confused.

Men descending shaft to mine coal that will keep British home fires burning.

WASHED OIL-TREATED COAL

Plus Capacity and Fast Truck Loading Feature Tom Endsley's Burning Star Agency

A COAL SALES agency reaching seven states by truck is operated by Tom Endsley across from the Burning Star plant of the Truax-Traer Coal Co., DeSoto, Ill. Located in a major coal-mining section of the State, where large commercial mines vie with more than a hundred wagon operations for business, Endsley serves trucks from Arkansas, Illinois, Iowa, Kentucky, Missouri and Tennessee which come in regularly or drop by for Burning Star washed coal.

The success of the Endsley sales agency in selling this coal is based, first, on the fact that it is a washed product produced by Truax-Traer's Burning Star mechanical plant, and, second, on service, for 1,000 tons of bin capacity is available for loading. With 20 trucks in a line, no one need wait until coal is mined. If need be, three trucks can be loaded at a time, two at a rate of 2 to 4 tons per minute. A third factor is Viking hot-vapor oil treatment and last is quantity accurately determined and recorded on a Fairbanks springless dial weighing mechanism. Weights are automatically printed on the bill, so there are no errors. Truck retailers like this service and, from as far away as Texas, come back for more. Whether the coal is to be brought from the washery to the stock bins, sprayed to allay dust, loaded in trucks, or weighed, a push on a button does the work.

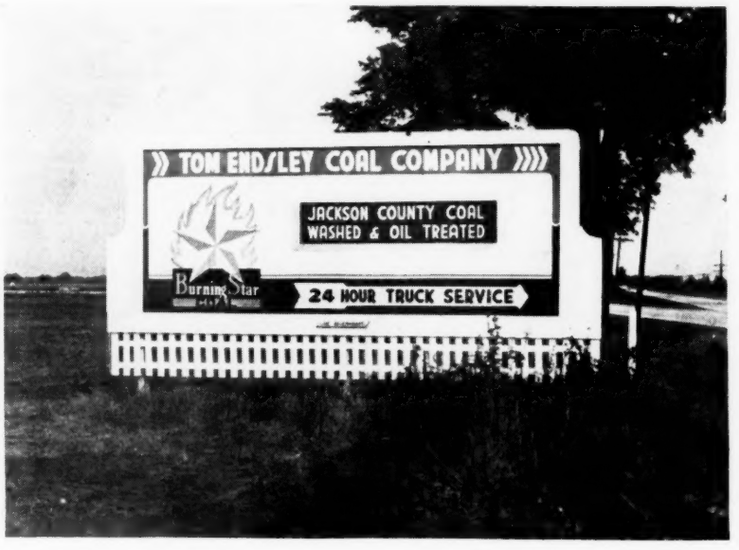
An available site across the road from the Burning Star washery offered the logical location for the sales-agency plant. Here are the storage bins, office and scale. The storage capacity, totaling 1,000 tons, is divided equally between bins for 4x8-in. lump, 2x8-in. lump and $\frac{3}{4}$x$\frac{1}{4}$-in. stoker. The bins are made of heavy oak, and if it were necessary they could carry a much heavier load than that for which they were designed.

Contrary to custom, the bins are built low on the ground. Under the center of each bin is a steel conveyor. These discharge onto hinged apron-type loading conveyors made from abandoned loading booms cut down to 36-in. widths for the lump sizes and 18-in. for stoker. Shepard boom hoists permit raising and lowering these conveyors to accommodate any commercial truck. Under the bins are hand-operated gates for regulating the flow of coal; also oil sprays for treating each grade. Pushbutton control and expert estimating permit exact loading.

Coal is delivered from the washery across the road by means of a belt conveyor discharging into a cross conveyor over the bins. Spiral steel chutes lower the coal into the bins without breakage.

Office equipment includes a Fairbanks dial scale adjustable for loads ranging from 20,000 to 100,000 lb. in 10-ton steps. The scale platform is 44 ft. long and will accommodate a 25-ton truck of the type used to haul coal from the pit. The scale automatically prints tickets for each delivery, registering on five slips the tare and net weights, and by code symbols designating the kind of coal and showing also if it has been oil-treated.

Commercial trucking has become a 24-hours-a-day business. To meet this condition, the Endsley sales agency also functions 24 hours a day. Large storage capacity and facilities for prompt loading, together with washed, oil-treated coal, largely account for the wide spread of its service.

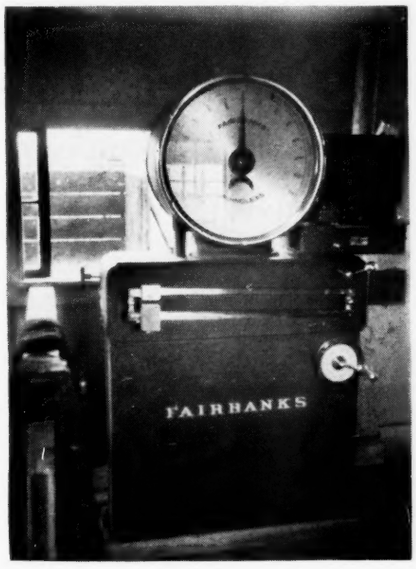


The sign tells who, what, where, when, how and points the way.

Tom Endsley's coal is prepared in the Burning Star mechanical plant at the left. His sales agency is across the road at the right.

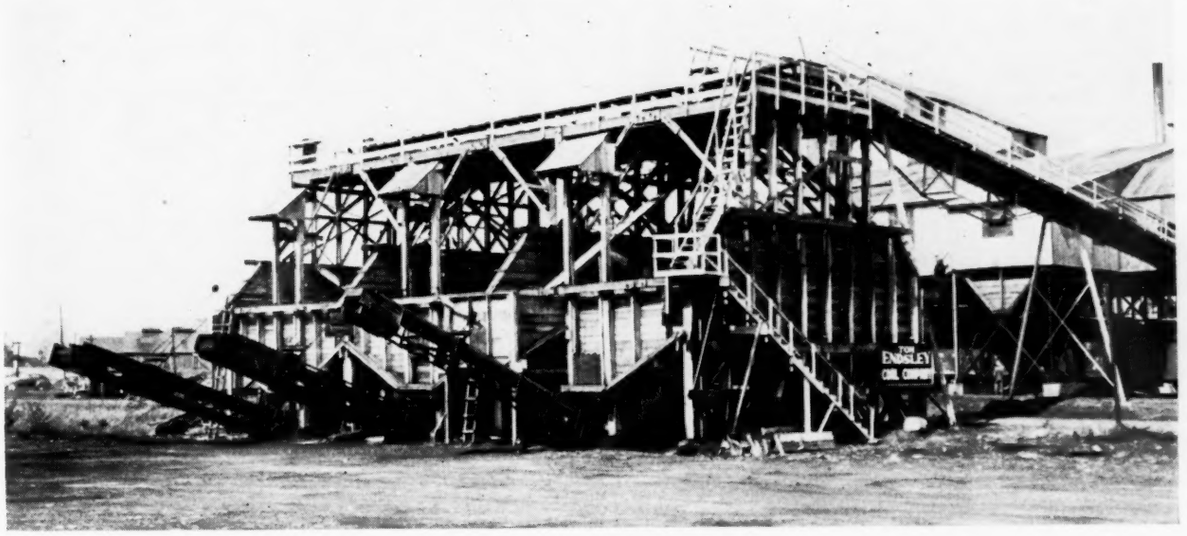
Right-hand man, Elmer Stamm.

Modern scale equipment provides exact weight, registration and calculation.



Putting a load of lump on a truck.

Storage bins and loading conveyors ready for action.



FOREMEN'S QUESTION FORUM

How to Keep Belt-Driven Machines Running And Lengthen the Life of the Belts

By J. R. HOPKINS
Engineering Department
Chicago Belting Co.
Chicago, Ill.

EVEN when operated 24 hours per day and seven days per week, belt drives will continue to give good service. Leather and V belts will be found easy to maintain, if the following simple and readily understood rules are observed.

(1) *Keep belts dressed* or their fibers will become dry. And keep them clean. Under ordinary conditions, apply a good leather-belt dressing every three months, but as often as every month or even every week if the air is dusty or very dry or if the belts are overloaded. To clean a belt, wipe off the dirt with waste dipped in gasoline, naphtha or carbon tetrachloride. Then let the belt dry and apply belt dressing.

(2) *Make all leather belts endless;* they will then last longer and there will be no fasteners to become loose. Your millwright can be taught at the nearest belt shop how to make endless laps, or your belt supplier will make the needed laps for you. If you have many leather belts, buy clamps and rods and ask for a book of instructions; then you can make all the belts on your pulleys endless. Metal fasteners are the weakest elements in a belt, and a belt is no stronger than its weakest part.

(3) *See that your belt thickness is suitable for the pulley diameter.* Table I shows the minimum pulley diameters for leather belts of different thicknesses. Do not use belts of these thicknesses on pulleys smaller than those here prescribed. Thus a heavy double-ply belt less than 8 in. wide should not be used on any pulley of less than 12-in. diameter.

(4) *Be sure belt is right size for load.* If belt-driven machinery is to operate successfully, it must be provided with enough continuous and dependable power to handle all peak loads, no matter how frequent or severe they may be. Hence, the full power of the motor or line shaft must reach the driven machine through the belt, and enough belt must be provided for that purpose.

Lineshaft Belts and Long-Center Drive Belts—If any belt-driven machine does not work perfectly, check the belt size. Ask any belt maker for the American Leather Belting Association 1939 horsepower table and then check width and thickness of belt with this table. If the trouble is real or continuous, choice of the right belt size probably will correct the trouble.

Short-Center Leather-Belt Drives From Electric Motors or Gas Engines—Such drives cannot be used with motors that slide on rails; they are permissible only with a pivoted motor base that automatically tightens the belt when running. With these bases, leather belts are efficient and have a long life. Practically no drive maintenance is incurred. A "Short-Center Leather-Belt Drive Data Book," which your belt supplier can provide, will give you complete tables from which you can check quickly and easily any short-center belt drive. Use this data book as your authority, and your drives will require scarcely any maintenance, and your belt life will be long. Again be sure that the pulleys are large enough to provide the necessary belt speeds. Doubling the belt speed doubles the horsepower that a belt will transmit or, with the transmission of the same horsepower, will cut in half the stress in the belt. Be sure that the motor pulley is no smaller than the diameter recommended by the motor manufacturer. Nearly all unsatisfactory drives give that disconcerting service just because the small pulley is too small. See Table II for minimum pulley diameter of National Electric Manufacturers Association (NEMA) motors.

If it should ever develop that you have to change over from a V-belt drive to a leather belt, the Data Book will explain all you need to know. Installation will be easy and quickly accomplished.

How to Get the Most Out of V-Belt Drives:

1. In designing new installations always use larger sheaves than the minimum recommended and use one or two belts more than the minimum number specified. Additional material and cost is offset by considerably longer life.

2. Be sure to purchase *matched sets* of belts so that each belt will carry its full share of the load.

3. Don't force or pry the belts over the sides of grooves. Slide the motor forward to put the belts on and then slide it back to provide tension. Better yet, use a pivoted motor base under the motor, and belts will go on easily and always run at the right tension.

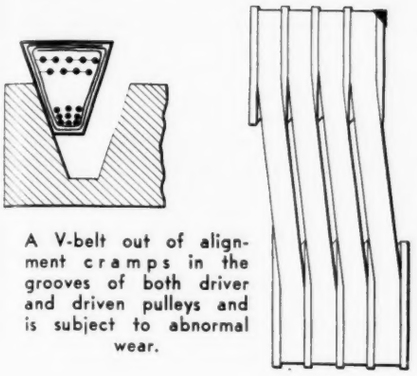
4. Proper alignment of sheaves is very important to long V-belt life. Be sure the sheaves are lined up in both horizontal and vertical planes. A little reflection will show that, if a multiple V-belt drive is misaligned, the ropes will scrape down one side of the grooves as they enter the driven pulley and

Table I—Least Pulley Diameters Usable With Belts of Specified Thicknesses

	Single-Ply		Double-Ply			Triple-Ply	
	Medium	Heavy	Light	Medium	Heavy	Medium	Heavy
Belts under 8 in. wide	3 in.	5 in.	6 in.	8 in.	12 in.		
Belts 8 in. wide and wider			8 in.	10 in.	14 in.	24 in.	30 in.

Table II—NEMA "Standard" Pulley Diameters for Different Motor Speeds and Horsepowers

Frame No.	3600 RPM	1800 RPM	1200 RPM	900 RPM	720 RPM	600 RPM	Standard Pulley Diameter	Face	Bore
202		¾	½				3	3	⅝
204	½–1½	1	¾–1	½			3	3	⅝
224	2–3	1½	1½	¾	½		4	3½	1
225		2		1			4	3½	1
225	5	3	2		¾	½	4	3½	1
254				1½	1	¾	4½	4½	1⅛
254	7½	5	3	2	1–1½	¾	4½	4½	1⅛
284	10	7½	5	3	2	1½	5	4½	1⅛
324	15						5	6¾	1⅝
324		10	7½	5	3	2	6	5½	1⅝
326	20						5	6¾	1⅝
326		15	10	7½	5	3	8	6¾	1⅝
364		20					9	7¾	1⅞
365			15	10			9	7¾	1⅞
365		25			7½	5	9	7¾	1⅞
404			20	15	10	7½	10	7¾	2⅛
405		30			15	10	10	7¾	2⅛
405			25	20			10	7¾	2⅛
444		40			20	15	11	9¾	2⅜
444			30	25			11	9¾	2⅜
445			40	30	25	20	11	9¾	2⅜
504			50	40	30	25	12	11	2⅜
505			60		40	30	14	13	2⅞
505				50			14	13	2⅞



A V-belt out of alignment cramps in the grooves of both driver and driven pulleys and is subject to abnormal wear.

similarly scrape down the other side of the grooves where they enter the driving pulley. This constant scraping action will tend greatly to reduce rope life. If misaligned, the drive should be realigned at once.

5. *Keep V-Belts Tight*—V-belts need correct tension just as much as other belt drives. If no pivoted base is used, check the tension 36 hours after preliminary operation and at frequent intervals thereafter to make sure the V-belts still have the correct live, springy vibration when struck by hand.

6. Check sheave grooves to make sure they are smooth and not worn out of shape. If they are rough or worn, provide a new sheave.

7. *Keep V-belt clean* and free from dirt, grease and oil. No belt dressing is necessary. Just wipe the belt with cloth or waste dipped in gasoline.

8. Never replace part of a set of V-belts with new ones. Replace the whole set with new V-belts and save the old ones for spares to be used with other old ones.

Experience shows that the most satisfactory and cheapest belt drives are those with belt speeds from 3,500 to 4,500 ft. per minute. With them narrower belts and pulleys can be used; lower bearing pressure is required; belt life is longer, and generally more satisfactory operating results are assured.

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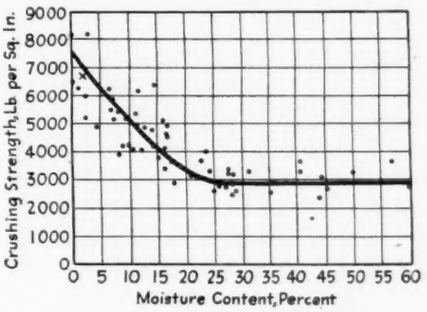
British Mines Plan to Dry Their Posts Underground

British mines are much hotter and drier than ours, and their weather only too frequently is, as they say, "nawsty," so we may be excused if we are a little slow to follow the suggestion of the investigator of the Lancashire and Cheshire Safety in Mines Committee that the timber for use in the mines be dried underground. Reducing the water content adds to or detracts little or nothing from the strength of timber until the percentage of moisture, at first 60 percent, is reduced to 27 percent. Between these limits with a certain wood, the crushing strength is about 3,000 lb. per square inch (see chart).

At 27 percent of moisture, the strength slowly increases and when further reduced to 15 percent, it is over 4,000 lb. per square inch; here the increase of strength gets fully under way and, when all the moisture has been drawn from the cells of the timber, the strength reaches about 7,500 lb. per square inch. Also, when a moisture content of 20 percent is reached, the fungus growths become dormant, so that the timber is less likely to rot.

To dry the posts and afford the additional strength, the posts are carefully stacked in abandoned roadways, and the air is allowed to travel around them. In America, they probably would develop fungus and gain weight, but in Great Britain they are subjected to a slimming process in the warm dry air of the mine and the fungus cannot attack them. Apparently, the British need strong posts and do not find it desirable to set them until they have been dried enough to obtain their full strength. They would dry when set in place, it is true; in some cases more rapidly and in other more slowly than when stacked in roadways, but they would be in stress from the moment of erection, and thus might fail before reaching their maximum dryness and full strength.



Strength of posts depends on the percentage of moisture. A well-cured post is much stronger than one that is still green.

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One Haulage Accident in Five Occurs in Coupling Cars

Figures of the U. S. Bureau of Mines show that in the last eight years 20 percent of the haulage accidents (actually 19.68 percent) were due to coupling cars, 14.29 percent being classed under "struck, run over or squeezed between cars or locomotives while coupling" and 5.39 percent under "squeezed between car and rib, timber or roof, while coupling." This source of accident needs study at all mines, for accidents are more numerous in mine haulage perhaps than in any other mine occupation when considered in the light of the number of men employed at that work. Where cars have to be coupled, width, plenty of light, clean roadways, straight track, coupling aids and care—always care—are necessary. One accident less in five would make a big hole in the haulage accident record and save the mine foreman a lot of grief.

Table III—Belt Speeds in Feet Per Minute for Different Pulley Diameters and Revolutions Per Minute.

Pulley Diameter Inches	Speed of Pulley Revolutions per Minute							
	3450	1750	1150	850	690	575	490	435
1½	1354	687						
2	1805	916	602		Belt Speed F.P.M.			
2½	2257	1145	753					
3	2708	1374	903	667				
3½	3160	1603	1054	779	632			
4	3611	1832	1204	890	721	602		
4½	4062	2062	1355	1001	810	677		
5	4514	2291	1505	1113	902	752	642	
5½	4965	2520	1656	1224	992	828	706	
6	5417	2749	1806	1335	1082	903	770	684
6½	5868	2978	1957	1447	1171	978	834	741
7	6319	3207	2107	1558	1261	1054	899	798
7½	6771	3436	2258	1669	1351	1129	963	855
8	7222	3665	2408	1780	1441	1204	1027	912
8½	7674	3894	2559	1892	1532	1279	1091	969
9	8125	4124	2709	2003	1622	1355	1155	1026
9½		4353	2860	2114	1715	1430	1220	1083
10		4582	3010	2225	1800	1505	1284	1140
10½		4811	3161	2337	1892	1580	1348	1197
11		5040	3311	2448	1980	1656	1412	1254
12		5498	3612	2670	2161	1806	1541	1368
12½		5727	3763	2782	2256	1881	1605	1425
13		5956	3913	2893	2342	1957	1669	1482
13½		6185	4064	3004	2435	2032	1733	1539
14		6414	4214	3115	2522	2107	1797	1596
14½		6644	4365	3227	2617	2182	1862	1653
15		6873	4515	3338	2705	2258	1926	1710
15½		7102	4666	3449	2800	2333	1990	1767
16		7331	4816	3560	2882	2409	2054	1824
16½		7560	4967	3672	2973	2484	2118	1881
17		7789	5117	3783	3062	2559	2182	1937
17½		8018	5268	3895	3158	2634	2247	1994
18			5418	4006	3240	2710	2311	2051
18½			5569	4117	3338	2785	2375	2108
19			5719	4228	3422	2860	2439	2165
19½			5870	4340	3518	2935	2503	2222
20			6020	4451	3605	3011	2568	2279
21			6321	4673	3793	3161	2696	2393
22			6622	4896	3965	3312	2824	2507
23			6923	5118	4150	3462	2953	2621
24			7224	5341	4330	3613	3081	2735

QUESTIONS ASKED BY STATE BOARDS

Queries Posed Candidates for First Class Mine Foremen in Virginia

Haulage and Timbering

If the statement is true put a + in the ( ). If it is false put a 0 in the ( ).

(0) Haulage crews should wear loose-fitting, comfortable clothing.

[Safety requires that the haulage crews should not wear clothing that will catch in the projections of mine cars or locomotives, or in switches. Socks should be drawn up over the bottoms of trousers, and loose coats with bulging pockets should be avoided. Tools and rules should not be carried in overall pockets.]

(+) Clearance should be maintained on haulage roads where men have to pass trips.

[Sec. 1875 of the mine law of July 1, 1940, requires that slopes, engine planes and haulage roads used by any person in the mine shall be made of sufficient width to permit persons to pass moving cars with safety, or refuge holes shall be made on one side of such haulage roads not less than 5 ft. in width and not less than 4 ft. in depth. The refuge holes shall be no less than 80 ft. apart and shall be kept free from obstructions. The roof and sides shall be made secure and kept whitewashed at all times.]

(0) Shelter holes should be placed every 50 ft.

[The required distance is not more than 20 ft. and, as provided above, no shelter holes are necessary if enough clearance is provided for safe passage past moving cars.]

(+) Refuge holes should be provided on each side of permanent trapdoors.

[The law makes no such provision, but such refuge holes are desirable, for the door is likely to be bumped open unexpectedly by the locomotive or to be swung open by automatic equipment so suddenly as to endanger men traveling along the roadway unless a convenient refuge hole clear of the swing of the door is available. Protection is supposed to be afforded by lights, but, with a door hiding the trip, no such protection is afforded. A door is especially desirable if a trapper is in service.]

(+) All main-line trips should have lights on front and rear.

[Sec. 1858, act of July 1, 1940, provides that on all haulways, where hauling is done by machinery of any kind, the mine foreman shall provide a proper system of signals and a conspicuous light on the front and a light or marker on the rear of every trip or train of cars when in motion; but this shall not apply to trips being hauled by gathering locomotives or mules when operating on other than main headings.]

(+) A limit of 10 miles per hour should be adopted for all mantrips.

[No limit of speed is set by the mining law, but tracks in the mine being, as they usually are, none too well ballasted and maintained, and the cars somewhat wracked, a higher speed would be suicidal, but, with the best equipment, higher speeds are not undesirable.]

(+) Motormen are responsible for all mantrips.

[No provision is made in the mine law, but motormen and trip riders shall not permit, under Sec. 1868, any person or persons to ride on locomotives or cars unless granted permission by the mine foreman.]

(+) Short steel jumpers should be provided for rerailing cars which have left the track.

[No provision in this respect appears in the mine law, but steel jumpers are needed to avoid overstrain and other injury in rerailing cars or locomotives.]

(+) Motormen should not leave trips in or near trapdoor.

[No provision is made in mine law, but a trip standing in a mine door will destroy the ventilation of the area for which the door has been provided. If a trip is allowed to stand near a door, another trip coming to the door on the opposite side may suddenly burst through the opening and be unable to stop in time to avoid a collision.

[Air travels on both sides of a trip and, if a trip is stopped across the opening to a side heading, only the air on one side of the heading will have an unobstructed approach to the side heading. This will interfere a little with ventilation. Otherwise, the trip will be no more effective in retarding ventilation at this point than in any other.]

(+) Switches should always be aligned for working places.

[No provision is made in mine law. Badly aligned switches cause derailments, direct accidents from this cause; also hernias and sacro-iliac affections, that are suffered by those who overstrain their ligaments in replacing the derailed cars. But this question possibly refers to leaving switches turned for cars leaving rooms. This is bad practice, for cars on the straight roadway may be derailed.]

(0) Only brakemen are allowed to cross moving trips.

[Though the law does not forbid brakemen from thus crossing trips and specifically permits them to get on or off a locomotive or car while in motion, the practice of crossing a moving trip even by brakemen is quite dangerous, as, in the combined action, less caution is used than in merely mounting onto, or dismounting from, a trip.]

(0) The purpose of timbering is to support the roof.

[This is true only when the workings are under relatively shallow cover, and covers in Virginia almost invariably are heavy. If the cover over the coal bed is considerable, the timber is rarely competent to support the roof up to the surface of the ground. The usual purpose of timbering is merely to hold the drawslate close up to the main roof as that roof sags, so that the drawslate will sag with the main roof but cannot fall. The main roof must be supported by the pillars or must be allowed to subside or fall beyond the working area, thus by its breakage relieving the weight on the area where the roof is to be supported. Sometimes the roof is so heavy that even pillars cannot support it; then longwall becomes necessary.]

(+) Safety posts should be set as soon as the place is cleaned up.

[Nothing should be allowed to delay the erection of safety posts, which should be set one by one as soon as space is cleared for their erection.]

(0) Cap pieces should be made of hard oak wood.

[It is usually best to have cap pieces that will crush a little under pressure; otherwise the post will be broken. A slightly crushed cap will hold the drawslate in place, but a broken post, broken because the load is not cushioned by a soft cap, will fail and let both cap and drawslate down. The posts should not relieve the pillars of the work they alone can perform. Soft pine or poplar makes a preferable cap piece, especially with heavy cover.]

(0) Moving machinery is the cause of most accidents.

[The most frequent cause of accidents is falls of roof and coal or probably falls of roof alone, but haulage injures, far and away, more persons when figured on the small number of men employed in that particular work.]

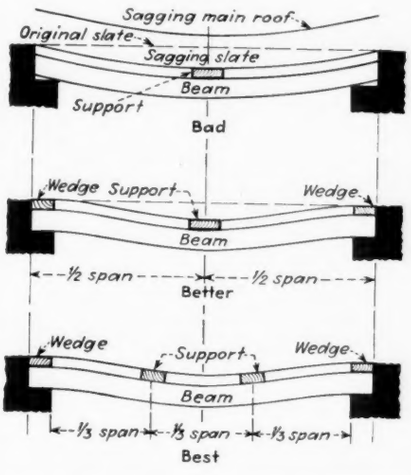
(0) Timbers should be set as close to the track as possible.

[Setting timbers close to the track usu-

ally is undesirable, as they may be dislodged by roof rock or coal projecting from the sides of the cars or by a derailment, and because men will have to travel back of the posts, or else be jeopardized by inadequate clearance in passing cars. However, there are occasions where the timber must be so placed, or the slate will not receive the necessary support.]

(0) Under all roof conditions, timbers should be wedged tightly.

[With steeply inclined coal beds, posts should be wedged so that they cannot fall over and in all cases so tightly that they will undertake promptly the work for which they are erected—namely, the support of the drawslate—but too tight wedging, especially if the cap piece is of hardwood, will put a considerable burden on the post from the start, and that load will serve no purpose. The post and its cap piece should prevent the slate from springing from the roof proper, keep it from cracking and letting in air and moisture through and above it, by which it would be weakened.



Any more support than that is excessive. If, however, cross timbers—not posts—are meant, it is well to wedge the timber tightly where it is notched into the rib or where it rests on the post at either end because a timber thus wedged is much stronger than if laid loosely in the hole or on the post. It also is well to arrange points of pressure between roof and cross timber at a distance from the rib equal to a third of the span between supports and to arrange that the weight of the roof shall not fall on the mid-span, where it will have more leverage than when located at one-third of the span. See illustration.]

(0) A standard system of timbering is undesirable.

[It is always well to have a standard, so that the miner can be held to strict compliance, but he must be made to understand from the first that more timber may be needed, and this he may, and should, erect if conditions are not standard. Crevices in the roof should be carefully supported with timber additional to that provided by the standard. Most miners have never given post and cross-timber stresses any consideration.]

(0) For permanent timbering, hickory cross collars are preferred.

[When an oak or similar timber is overloaded it cracks and does not fall immediately, but a hickory collar when overstressed suddenly cracks and falls. Hence it gives no opportunity for a timberman to replace the timber and prevent an accident.]

(0) Loose slate on all haulways should be well timbered.

[Such slate should be ripped if it can be done at reasonable cost and delay, for a wreck will knock out the timber and dislodge the drawslate and the moisture will destroy it if the slate becomes cracked. When slate tends to break, it is best to forestall trouble by early timbering or by some other means of roof preservation. A stitch in time saves nine.]

(0) Timber set on 7-ft. centers will take care of most roof conditions.

[In general, timber set at such remote centers will serve no good purpose unless set under a roof with only local defects.]

(+) Slate containing kettlebottoms and slips makes the most dangerous roof.

(0) Stop blocks should be used only in places going to the dip.

[Stop blocks should be used on any gradient up or down. On dip gradients, the car may run into the face, knock out a safety post and squeeze a man between the car and the coal; and, on rise gradients, it may run back out of the place and kill someone on the heading, run into a trip or leave the track and cause a bad derailment. Beware of hernias and sacro-iliacs and other strains caused by attempts to rerail locomotives and cars.]

(0) Not over three men should be allowed to ride a locomotive.

[There is no room for three men to ride on a locomotive except when one man rides on the cover of the motor, which is unsafe, for he may be squeezed between roof and locomotive or thrown off on a curve. No person, says Sec. 1869, except the persons necessary to operate the locomotive, trip or car, shall ride on any locomotive or car unless granted permission by the mine foreman.]

(0) Fast-speeded gathering locomotives are the most efficient.

[It has been found that high speed with gathering locomotives is inefficient, as the battery has too soon to be recharged unless it is made unusually large; and then that heavy battery will have to be hauled around by the power of the battery, which is not economical. Especially inefficient is a high-speed battery locomotive where gradients are heavy.]

Questions and Answers, Examinations for Anthracite Foremen and Assistants

Gases in Coal Mines

Q.—Name three principal gases found in coal mines; state their effect on life and their injurious effects on man. Give their chemical symbols and specific gravities.

A.—Omitting oxygen and nitrogen, which are present in the air entering the mine, the three principal gases are methane, carbon monoxide and carbon dioxide. The third gas is found also in the atmosphere but far more abundantly in the mine.

Methane, the first of the three gases, when in quantity is said to suffocate those attempting to breathe it, but so will any gas other than oxygen. When mixed with air between the proportions of 5 and 15 percent, methane will explode. These figures assume, however, that the air is free from other gases than oxygen and nitrogen and the last two are present in their normal proportions.

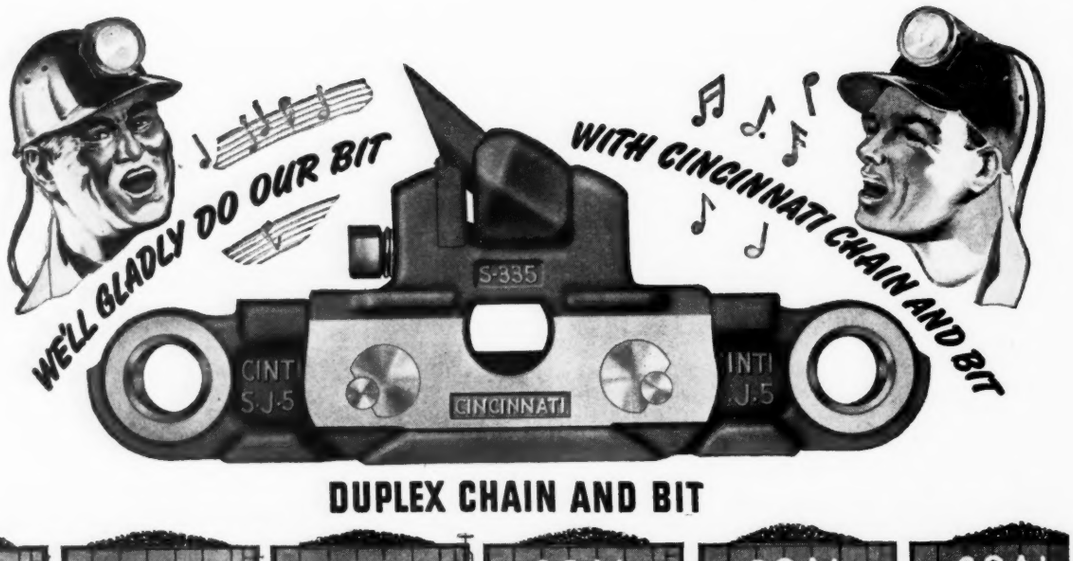
According to I.C. 6893, a percentage of oxygen below 16 percent menaces life, no matter what the other gases may be. Methane is not poisonous. It has been suggested that, in large percentages, it may cause temporary mental derangement, at least in some persons. Carbon monoxide is a very poisonous gas. The maximum percentage that may be breathed for a considerable time without producing permanent injurious aftereffects is commonly placed at 0.05 percent, five parts in 10,000. It causes shortness of breath, headache, giddiness, heart palpitation, weakness, excitement, sometimes drowsiness and stupidity. It probably never occurs in the mines in an explosive percentage, but, though in the mines it is relatively harmless as an explosive, it is formed in sufficient quantity by explosions, especially coal-dust explosions, and in mine fires to kill many persons yearly.

Carbon dioxide is a non-poisonous gas but persons will suffocate because of its presence if the percentage of oxygen thereby is made low enough.

Gas	Chemical Symbol	Specific Gravity
Methane	CH_4	0.5543
Carbon monoxide	CO	0.9672
Carbon dioxide	CO_2	1.5282

(Strictly speaking, neither carbon dioxide nor methane suffocates, but as the human body cannot exist without oxygen, anything that reduces the quantity of oxygen taken in a single respiration prevents the body from getting the oxygen it needs and tends to cause the body to suffocate. In high altitudes, where the air is of low density, the body does not get enough oxygen and accordingly tends to succumb to suffocation. The lack of oxygen in pounds per square foot in rarefied air is as injurious as the lack of oxygen induced by the presence of inert gas or the removal of oxygen from air under normal pressure. Carbon dioxide stimulates respiration and so, in small quantity, increases the oxygen intake. That is why it is used with oxygen to bring suffocated people back to consciousness. However, the fact that people are only indirectly suffocated by carbon dioxide or methane does not make these gases any the less dangerous to human life. The effort to keep their percentage concentration down is not any the less important because of that fact.)

• Continued from May, 1942, *Coal Age*, p. 62.



DUPLEX CHAIN AND BIT

"KEEP 'EM ROLLIN"

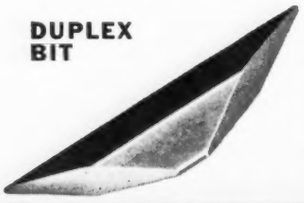
AT TOP SPEED with CINCINNATI CHAINS & BITS

GIVE the men in your cutting rooms every opportunity to do their bit for Uncle Sam. With industry making heavier demands on producers of coal and production schedules being stepped up daily, Cincinnati Cutter Chains and Bits assume a more important role than ever before. Eliminate bottlenecks in your cutting rooms . . . step up your production . . . lower your per ton cost . . . keep your operators satisfied . . . help yourself and help your country with the world's finest Cutter Chains and long life Bits. Write for detailed information.

THE STANEX ASSEMBLY

The Stanex provides low bit price and is efficient when cutting conditions are not too severe. It is not intended to supplant the Duplex in performance. The Standard Chain permits the use of either the Stanex Bit or the ordinary ½ by 1" bit.

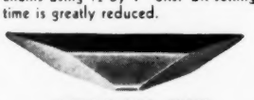
DUPLEX BIT



The Duplex Bit is especially made for exclusive use in Cincinnati Duplex Chains. The sharpest, long life, low cost, heat treated bit manufactured.

STANEX MOUNTING

A strong durable holder for use in Standard Chains. The long life Stanex Holder and Bit can be used in ALL chains using ½"by 1" bits. Bit setting time is greatly reduced.



STANEX BIT

Patterned after the successful Duplex.

THE CINCINNATI MINE MACHINERY CO.

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WHAT'S NEW IN OPERATING IDEAS

Monitor Plane Control Includes Contactors and Governor

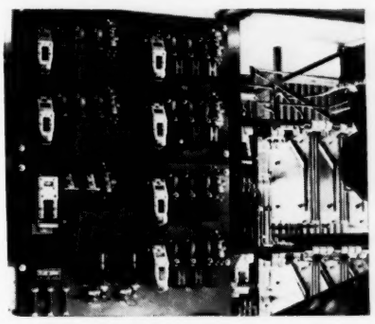
Regenerative braking with a wound-rotor variable-speed power unit is tricky because with ordinary manual drum control the lowest motoring speed is attained by keeping the controller on first point for that direction of operation. With generation, however, due to overhauling and braking, that same first control point will allow an overspeed disastrous to the motor, equipment and men. Consequently contactor control is an advisable selection for a combined power and braking unit. "Mogentor" is the name given such a unit in the article on the new Poinsettia mine of the Block Coal & Coke Co., Block, Tenn. (p. 66), equipped with a new 300-hp. Link-Belt monitor-lowering machine.

This "mogentor" is a General Electric Type MT wound-rotor 2,300-volt motor built for a 600-r.p.m. synchronous speed. It limits the speed of the descending monitor to 1,350 f.p.m. at which it is operating slightly above synchronous. The monitors operate in balance on the 4,000-ft. incline which has an average grade of 33 percent and a maximum of 46 percent. Monitors themselves weigh 12 tons and the load is 10 tons. The rope is 1¼-in. special plow steel.

Primary and secondary controls, master switch, ammeter and watthour meter were furnished by General Electric through Link-Belt. The ammeter is mounted on a board in front of the operator. On the same mounting is an electrical tachometer with scale graduations in feet per minute of rope speed. The generator of this tachometer is V-belt driven from the end of the motor shaft.

A flyball governor (Logan Engineering Co.) is chain-driven from the drive drum.

"Mogentor" 300 hp., 600-r.p.m., with tachometer generator on left end.



Primary and secondary contactors of the cam-operated master switch control.

Its duty is to open a control circuit in case speed exceeds by 15 percent the normal 600 r.p.m. for this motor. This breaking of the control circuit opens the primary contactors between line and "mogentor" and at the same time deenergizes a 6-in. "Thrustor" which, during normal operation, holds the gravity-set brake band free of the brake drum.

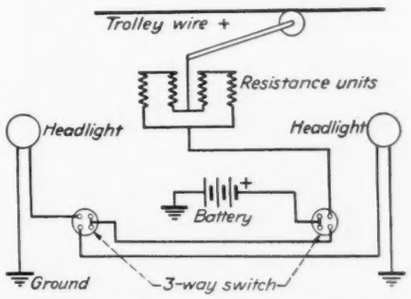
Normally the operator keeps close tab on the electric tachometer and handles the cam-operated master switch so that lowering speed does not exceed the 1,350-ft. maximum. His error or an electrical or mechanical failure that would allow 15 percent greater speed, would stop everything.

•

Haulage on Grade Made Safer By Battery Headlights

Storage batteries are used on the sealed-beam 6-volt headlight installations on main-line locomotives operating in the Tierney mine of the Tierney Mining Co., Stone, Ky. This type of lighting, suggested by Alvis Mercer, general mine foreman, and installed by N. F. Hale, chief electrician, has removed a hazard which had been a worry to the mine officials.

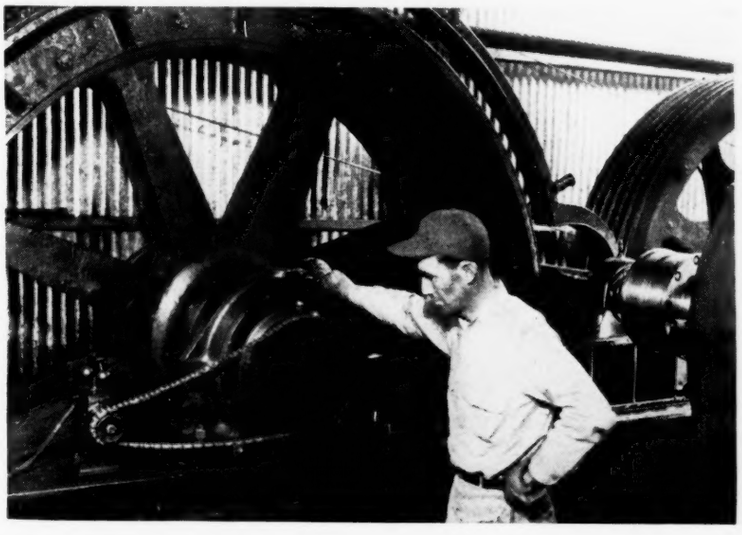
The accompanying wiring diagram, furnished through the courtesy of W. M. Gilliam, vice president and district manager, West Virginia Engineering Co., Williamson, W. Va., shows how two three-way switches are used to control the battery charging and lighting. The charging resistor is made up of four standard Wert resistances, each rated 1.8 amp., 128 ohms, and formerly used one at a time with the old-type 60-volt 94-watt bulbs. These resistances are connected in series-multiple, which arrangement doubles the current capacity and does not disturb



Connection diagram for battery headlights.

the net resistance. At 275 volts delivered to the locomotive the battery charges at 2.1 amp.

Charging is not done while the headlights are in use. One three-way switch disconnects the headlights when this switch is turned to put the battery on charge. The other turns on one headlight or the other. This battery is of the standard 3-cell 17-plate automobile type and, although in the locomotives at Tierney mine it is installed not far from the main control resistance and thus is in a rather warm place, the life averages at least a year. Locomotive operators switch their batteries to charge when on the outside or at times in the mine when there is a wait.



For safety, a flyball governor is connected to the drive drum.

Water is added by the maintenance men in the outside repair shop.

A long, severe grade on the main haulage in favor of the loads is where the safer operation is provided by the battery-powered headlights. For a considerable distance the trips cannot be stopped. Formerly when the power failed the trip had to continue without a headlight.

Reflector efficiency of the sealed-beam automobile lamp, of course, is well known and its use results in much better light than with the usual run of old-style locomotive headlights. At Tierney mine the following locomotives are equipped with the battery-operated sealed-beam lights: two Jeffrey 13-ton MH-100 and one Westinghouse 10-ton No. 907.

•

Fireproofness and Protection Mark Substation Building

Long life and fireproof construction throughout, a roof not likely to cause dripping on the equipment, maximum provisions for natural ventilation, and adequate facilities for locking and protection of doors and windows are features of a d.c. substation building at the new Poinsettia conveyorized mine (see p. 66 of this issue) of the Block Coal & Coke Co., Block, Tenn.

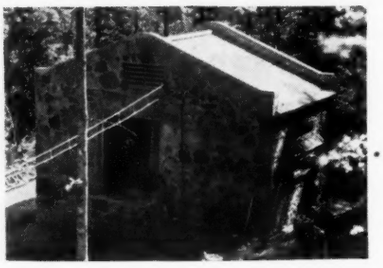
This substation is on the outcrop on Montgomery Fork on the opposite side of the mountain and 6,000 ft. by d.c. line from the haulage drift at the monitor headhouse. Field stone from the immediate vicinity of the substation was used for the walls, which are 12 in. thick. The roof covering is Johns-Manville ½-in. corrugated "Transite" supported by steel purlins. Pivoted window sashes and the double door also are of steel. One of the double doors includes a smaller door for men, and the other has louvers

Meets all the requirements for housing a substation.

which can be opened and closed. Window openings are protected by cages of heavy steel bars welded together and shaped to allow opening of the pivoted sash.

From the outside foundation wall three 12x12-in. ducts with intake openings protected by coverings of 1-in. mesh heavy wire cloth open to pits under the transformers and converter. Louvers in the building gables afford fixed openings for circulating air.

Present equipment in the building is a 150-kw. 275-volt Westinghouse converter with its transformers and having manual controls. It is the intention to add automatic feeder control to the d.c. side. Primary voltage is 2,300 and the power is purchased. M. M. Haley, chief engineer, designed the building.



The one pair of large steel doors includes a man door and an adjustable louver section.

•

Gob Disposal Mechanized At Kathleen Mine

The gob pile spreading out below the tipple produced mounting red figures, so "Bob" England, top foreman at the Kathleen mine of Union Colliery Co., Dowell, Ill., decided mechanical spreading of this material would lower the cost. A power shovel was tried and found wanting—under gob-pile conditions. It was too slow and too expensive to fit into Bob's cost sheet.

Side view of utility car.

Adjustable gob spreader.

Gob spreader at work.

At the lower end of the yard tracks Bob found a discarded 8-wheeled swivel-truck flat car of mine-track gage. This he worked over into a tool-and-material car for gob-track work, mounting an adjustable spreader blade on one side and a crane boom on one end. The spreader blade is about 6 ft. long and the boom extends about 20 ft. beyond the end of the car.

The handling of gob from the bin at the man-and-material shaft is by side-dump cars pushed out over the gob pile by a 5-ton Goodman camel-back trolley locomotive. The gob is piled alongside the track until it reaches the rail. The utility car then is pushed along the track with the spreader blade lowered to take off about 8 in. of gob. Succeeding passes finish spreading the gob, which is pushed away from the track down to the tie level. Only a few minutes of time

Finished stretch of levelled gob.

Crane holding track suspended for tamping up ties.

War and Wits

In these hectic days of war and material shortages, it frequently happens that the master mechanic must make shift to do with what he has or, perhaps without any compulsion, being a good citizen, he is looking around for opportunities to do his job with as little requisitioning as possible. He is using his wits and, while glad to contribute ideas to others, he is seeking in turn for their suggestions. Let this department act as his bank in which to deposit ideas and draw out others. Like many a bank, it pays interest on deposits; in this case $5 or more for each idea. Send yours in—with a photograph or drawing if this will help to make the idea clearer.

"Damn the torpedoes! ...full speed ahead!"

WHEN FARRAGUT stormed into Mobile Bay, his was a stirring watchword. "Damn the torpedoes! Full speed ahead!" Those are fighting words . . . to set the pace for a fighting nation.

And in every mine on the face of America, Farragut's slogan should set the pace. Damn the *difficulties!* Full speed ahead! Ores and minerals are needed, that our men at the fighting front may lay down a curtain of fire against a determined and treacherous foe. Our mines must be arsenals; our miners must be soldiers. From now until our final Victory dawns . . . we'll work at full speed to help *Keep America Rolling.*

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia
The World's Largest Manufacturers of Storage Batteries for Every Purpose
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is required to level off a stretch of gob, for the speed is about 5 m.p.h.

The lever operated crane then is brought into action, lifting the track bodily and holding it suspended until the section crew tamps up the ties at the new level. This is much faster than track jacks and leaves the entire track free for tamping. The whole operation is repeated until the desired height of gob pile is reached.

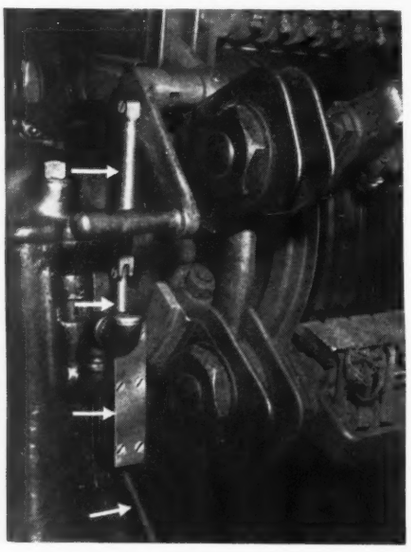
When the gob pile is to be widened laterally the lifted track is slewed over on to the newly leveled strip as far as needed. The trolley supports are spiked to the ties so that the trolley wire goes right along with the track. When it is desired to dump and spread gob on the opposite side of the track, the utility car is turned end for end.

•

Switch on Brush Lever Interlocks Starting

Numerous rotary converters with manual controls have suffered damage by closing the main circuit breaker to apply the load before the brushes are lowered. In addition, the man who is doing the starting may be injured if it happens that in this incorrect sequence of starting, the load should change from very light to very heavy at the time he is lowering the brushes. Such a coincidence can cause a bad flash-over. To prevent these possibilities of equipment damage and personal injury E. A. Richard, chief electrician,

•



Arrows point to connecting rod, plunger, contact box and conduit containing the lead wires.

Weeksbury (Ky.) mine, Koppers Coal Division of Eastern Gas & Fuel Associates, devised a switch operated by the brush-raising lever, or crank, and has equipped each converter with it.

The contacts of this switch are in series with the holding coil of the manually closed overload circuit breaker. As indicated by the illustration, the contacts are housed in a fiber box attached to the bearing pedestal. The connecting rod from this box to the brush lever has a pivot joint so that the switch plunger proper is not tilted sidewise as it is moved up and down.

Self-Supporting Stairway Built In Buckhorn Escape Shaft

The Consolidated Coal Co., Herrin, Ill., has just completed a spiral steel self-supporting stairway in the escape shaft at its Buckhorn mine. This shaft is circular in section, 6 ft. in diameter and concrete-lined.

The stairway is built around standard 6-in. iron pipe, to which radial webs are arc welded. The inner ends of the treads are bolted to these webs. The outer ends of the treads are bolted to angles welded to spirally rolled steel bands which extend from one landing to the next.

The steps are 16 in. wide at the outer end, making them 8 in. wide at the center point. They are 8 in. high. Therefore, the stairway climbs a 45-deg. spiral at the center line of the steps, or approximately 26½ deg. at the extreme outer end of the steps.

Ten steps and a landing (eleven steps) complete one turn of the stairway. Each landing covers 105 deg. of arc. Illinois mining

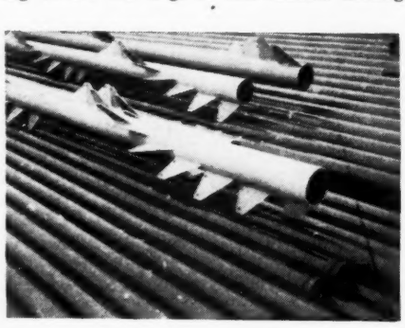


Fig. 1—Central pipe support; lugs welded on.

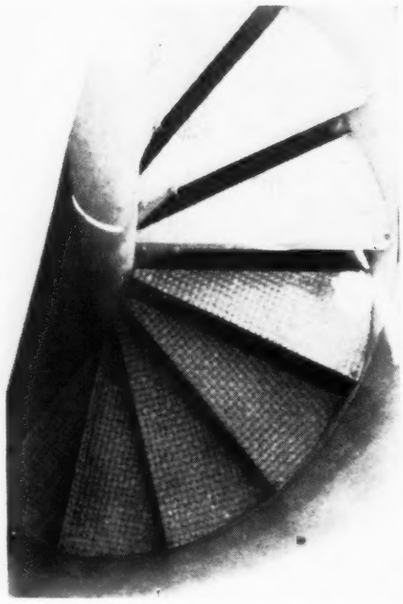


Fig. 2—Looking down on completed stairway.

laws require a landing for each turn of an escape stairway. These 27 landings are directly one above the other.

Total shaft depth is just under 200 ft. Two extra steps were added to the bottom spiral to complete the necessary length of the stairway. The final pipe support at the top extends 3 or 4 ft. above the top step to serve

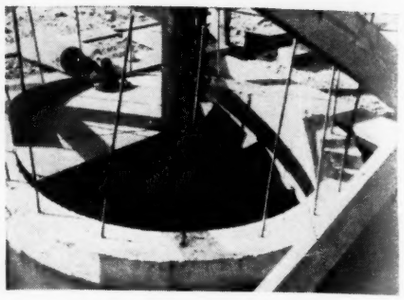


Fig. 3—Stairway at top of escape shaft; inclosure to be added.

as a handrail support. Each pipe has a ring welded inside the top end which protrudes about ¾ in. to serve as a guide for the pipe supporting the next section. After complete assembly the supporting pipe was filled with concrete to prevent rust.

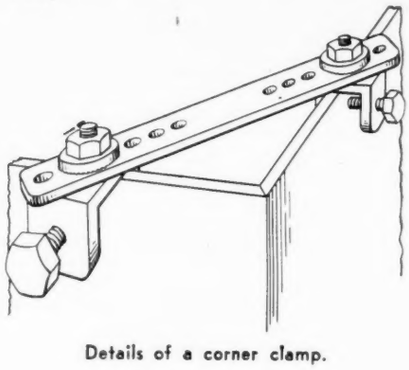
What might be considered scrap material was used for the supporting pipes and for the webs welded to them. A center line was marked along one side of the pipe to serve as a guide for the template which spaced and lined up the web plates for welding. The rest of the material was bought new. The steps were made of cross-hatched sheets (regular tread material) of such dimensions as to cut with little waste. The cutting and all fabrication, except rolling the spiral sheets, was done at the mine shops. The spirals were rolled in a commercial shop which had a set of 24-ft. rolls. By feeding the sheet through the rolls at the proper angle, the spiral came out in correct shape. On an hourly basis, the cost of this job of rolling was about $17.

This stairway was designed by J. H. Kuehner, engineer for Consolidated Coal Co., and erected under his supervision. The erecting time was 36 man-shifts.

•

Corner Clamp Facilitates Handling Plates

To facilitate the assembling of plates for soldering, welding or drilling, Chas. H. Willey, Penacook, N. H., suggests the corner clamp illustrated. The device consists of a bar with a series of holes and two small U-shaped clamps with integral studs and heavy serrated washers under the nuts. As indicated, the clamp can hold together at any angle two abutting plates. Several of these clamps in various sizes are a valuable asset to any assembler, erector or repairman, says Mr. Willey.



Details of a corner clamp.

MORE NEWS FROM THE FIELD

Supply Rooms, Federal Explosives Act and Face Dust Control Engross Indiana Men

WITH a double-barreled attack on the important problem of supply-room management, A. K. Hert called to order the spring meeting of the Indiana Coal Mining Institute on May 16 at the Hotel McCurdy, Evansville, Ind. Other subjects discussed were control of dust at working faces, and the Federal Explosives Control Act. Following the banquet, recognition of the untiring service of H. A. Cross and H. M. Ferguson on behalf of the institute was accorded in the form of life memberships, Secretary Harvey Cartwright making the presentation.

Firing the opening shot, E. M. Ingleman, supply-room manager, Snow Hill Coal Corporation, declared, "The supply-room manager and purchasing agent of today's modern coal mine—a mine supplied with the most practical equipment both for the production of coal and the safety of the men, and with a yearly production of well over one million tons—must always be alert and wide awake. He must be able to select and arrange a well-balanced stock of parts and supplies, thus assuring for operation the least amount of lost time and at the same time holding the inventory to the lowest possible figure."

A. K. Hert, president, Indiana Coal Mining Institute

Important features are the location of the supply room, arrangement and labeling of the bins, arrangement of stock, ease of finding parts and completeness of records. While limited quantities of certain supplies may be kept handy underground; if the main shop is on the surface, the supply room should be nearby. Its size should be adequate to care for about 6,000 items that such a modern mine must carry. The Snow Hill supply room is of two stories and contains about 4,000 sq.ft. of floor space.

If bins are purchased, their arrangement should be worked out by a person familiar with the stock requirements and assembled under his supervision. Space should be provided for new parts that may later be added. Compartments should be so arranged that fast moving parts, as bolts, capscrews, nuts and washers, are nearest the delivery window. The bin sections should be progressively lettered or numbered until all sections are designated. Each compartment of a row should be numbered; as 101, 102, 201, 202, etc., until all sections are completely numbered.

At the Snow Hill Mine, similar parts, as gears, brushes, bearings and bushings, are grouped for easier handling. The Acme card file system is used. It facilitates quick location of parts and maintains an accurate perpetual inventory. These cards are 5x7 in. They are filed in tills containing 80 cards, with 18 tills in a case. Three cases, with a total of 4,320 cards, are used. A card, reconstructed from Mr. Ingleman's description, is shown.

On the morning following issue of material, these cards are posted from the small supply-room requisition blanks, on which is listed the catalog number and description of the part, the department to which it is charged and the signature of the person receiving it.

A single-page classified catalog of parts of the various machines, framed and covered with glass, is maintained over the supply clerk's desk and over each mechanic's bench. On this sheet, parts are designated by catalog number, by the manufacturers' names and by the common shop name. These lists serve to identify quickly any machine part; for example, of a loading machine. This handy device was originated by the machine-shop superintendent.

At the receiving end, invoices are checked against orders and packing lists. A copy of each is sent to the superintendent for his approval and for payment. A copy of each also is filed in the supply room. The latter are used to debit the inventory cards. In addition, a daily record is kept of parts and supplies invoiced, used and on hand. A well-ordered supply room will go far "to insure certain and early victory in this world battle for a free democracy."

Describing the physical make-up and the inner workings of an underground supply room, of which there are few in Indiana, James Guiney, Princeton Mining Co., said: "Completely mechanized and now producing an average of 6,000 tons per double shift, Kings mine of the Princeton Mining Co., Princeton, Ind., requires a continuous supply of material and parts, in order to assure the management uninterrupted operation. This is accomplished through the medium of a storekeeping system now in use. It requires the services of two supply clerks, whose duties are to keep the supply room clean and orderly, make requisitions, receive and issue supplies and keep records."

Only supplies for use underground are kept in this supply room, which has concrete floor and walls, a metal ceiling supported by 70-lb. steel rails and is equipped with metal bins. This is in one room with two ells, forming a huge letter "F," having a floor area of 2,570 sq.ft. and a 7-ft. ceiling. The open center of the room is used for parts too large for the bins, such as cable reels, wire and drill posts.

Storage bins are divided into sections for the different types of machinery, and each section is subdivided. Subsections are lettered A, B, C, etc. Bins in each subsection are numbered 1, 2, 3, etc., and are tagged with the catalog number of each part or parts. A complete Insite card index system is maintained, which carries information on the part and its bin location. Daily routine supplies, as nails, friction tape, tools and miscellaneous items, are kept in wooden bins. They are not catalogued or listed on cards. A memorandum is made of all parts issued, noting catalog number and type of equipment on which it is used.

The supply room is connected by telephone with the four sections of the mine. Material called for during the working shift is set on a special platform by the supply clerk, and is picked up by the motorman from that section. For convenience in handling, this platform is locomotive height. A colored light indicates what section the material is

Received		Used		On Hand	
Quantity	Value	Quantity	Value	Quantity	Value

Cat. No. _____ Name _____ Sec. ____ Bin. _____

Snow Hill supply room card.

Harmony . . . for 25 Years

SINCE 'way back when the Old Barber Shop Quartet sang 'Sweet Ad-o-line' . . . we've been in close harmony with our agents and policyholders—25 years of successful specialization.

Harmony has had a lot to do with our success. Harmony in agency relations, safety engineering service and claim adjustments.

We've always tried to do a better job and to work as close as possible with our agents and policyholders for complete satisfaction and understanding.

Today we are one of Americas largest Agency companies specializing in workmen's compensation and attendant liability lines.

Assets exceed $9,000,000.00.

May we tell you more about it?

BITUMINOUS CASUALTY CORPORATION

ROCK ISLAND ILLINOIS

W. A. Gallagher, T. C. Higgins and J. E. Stanton, Bureau of Mines investigators, relax after the session.

for, and a blackboard carries any special instructions. The motorman turns off the light when he loads the material.

Minor repairs are made at the face. The repair man has a small supply of parts, replaced from the supply room at his request. Heavier repairs are made in the shop which joins the supply room. Special rebuilding jobs are done in a surface shop, but assembly is all done in the underground shop.

Armatures are sent away from the mine for repair or rewinding, except that shaft replacement is done in the shop. A continuous record is kept of armature repairs, with dates. This record has been of much value. Any machine brought to the shop for other repairs has its armature checked.

Replaced broken or worn parts are examined in the underground shop. If they can be salvaged, they are sent to the top, reconditioned and returned to the supply room as new parts. Several assembled clutch, jack, pump and other units are carried in the supply room for immediate use. Replaced units are brought into the shop to be overhauled, reconditioned and put in supply stock. Tools for special jobs that are occasionally required are carried in the supply room, issued and accounted for by the supply clerk.

Discussion revealed that there is some danger of machined parts corroding when stored underground. To prevent this, all machined parts are wrapped in oiled paper or coated with grease.

Doing something about coal dust, much of which is not visible, but enough of which will destroy visibility, is so new it is considered experimental by most coal operators. But George A. Mau, chief engineer, Johnson-March Corporation, New York City, declared, "We now know. There is no more guesswork."

The need for dust control at the working face has been greatly increased by mechanized mining. Independent studies of dust production, dust count, and means of reducing it have been made by the U. S. Bureau of Mines. Alleviation of atmospheric dust at its source is encouraged by that Bureau as one of the means of reducing explosive hazards.

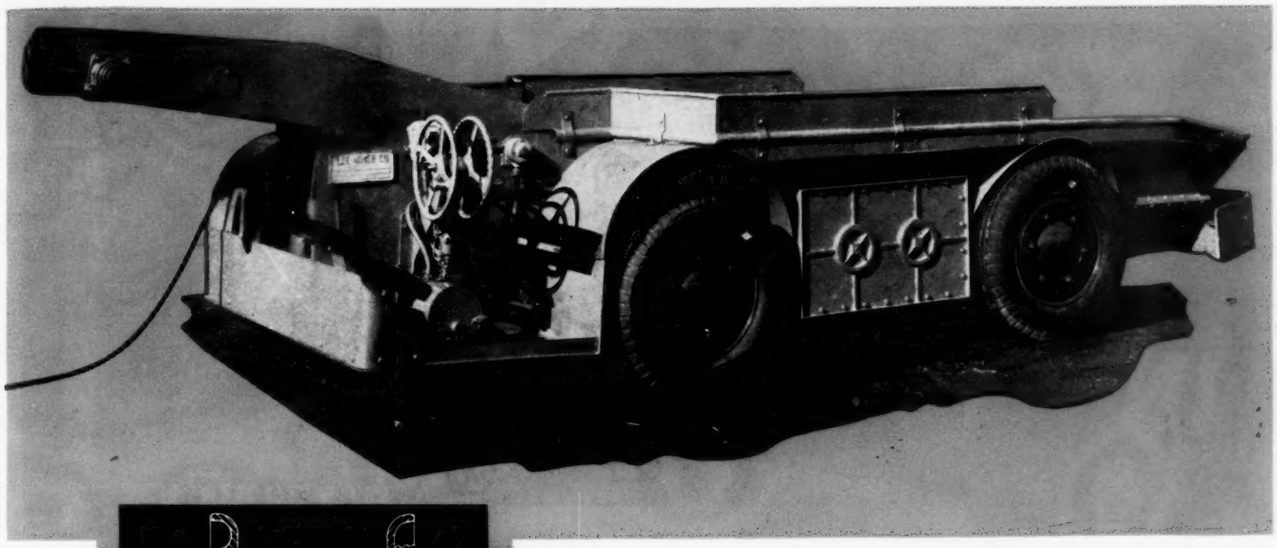
Among the many hints, data and suggestions mentioned by Mr. Mau about dust, and the practical application of dust-reducing methods, these seem elemental and practical:

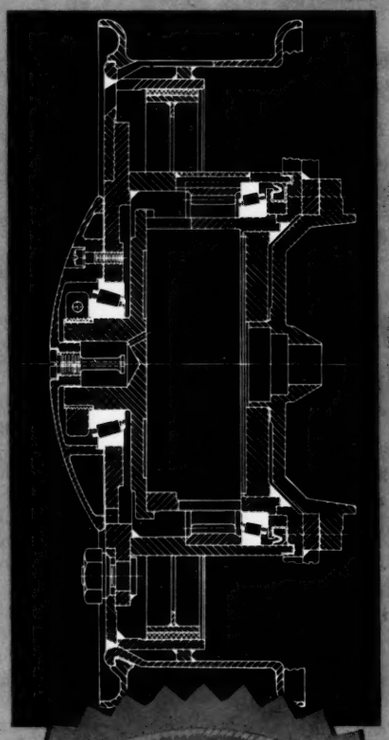
Facts and Data

1. Twenty million particles dust count per cubic foot is a clear atmosphere. Fifty to sixty million is not bad; but six times that amount makes vision difficult.
2. Shearing machines make nearly twice the dust of undercutting machines.
3. Shuttle cars make a dust hazard.
4. Control of dust will save money.

Kings Mine—Underground Supply Room

Number		Bins	Parts
2	10-BU Joy loading machines	423	
2	11-BU Joy loading machines		1,337
4	5-BU Joy loading machines	528	
4	7-BU Joy loading machines		
1	8-BU Joy loading machines		
2	26-A Goodman loading machines	200	416
2	L-600 Jeffrey loading machines	45	78
5	Track-mounted Jeffrey coal cutters	90	203
13	112-AA Goodman shortwall coal cutters	318	354
5	Sullivan Airdox Shooters	213	386
14	6 to 13-ton Jeffrey locomotives	307	457
10	6 to 13-ton Goodman locomotives	306	443
11	6 to 10-ton Gen. Elect. locomotives	162	266
14	5-ton Ironton locomotives	56	71
5	300-kw. General Elect. rotary converters	94	139
1	300-kw. Westinghouse rotary converters		
2	500-kw. Westinghouse rotary converters		
	All with transformers and switchboards		
	Pipe fittings, pump motors, portable air compressors	47	86
	Coal drills, small electrical supplies, bolts, screws, rivets and miscellaneous	324	347
		3,113	4,583





For Victory— and continued success afterwards; more Timken Bearing Equipped machines and more Timken Bearings per machine.

The far-sightedness of American coal operators in mechanizing their mines has proved its tremendous value in the present production emergency, but the peak has not yet been reached. There still is plenty of opportunity for increased use of mechanical mining equipment and for improvement of existing types of machinery.

Typical of the pioneering being done by progressive mining equipment manufacturers is the 4-Wheel Drive Koal-Mobile developed by the Lee-Norse Company and now sold by the Joy Manufacturing Company. The latest model of this machine is shown in the photograph.

The use of Timken Tapered Roller Bearings is an essential feature of the Koal-Mobile. Timken Bearings are installed in all wheels as shown in the engineering drawing. The extremely large bearing applied at the inside position permits the entire drive unit—motor and speed reducer—to be contained within the wheel assembly. This is a fundamental feature of the Koal-Mobile.

Does your mine have all the modern mechanical advantages it should have—including Timken Bearing Equipped mine cars, loaders, conveyors, hoists and specialized machines like the Koal-Mobile? You need them now. You'll need them just as urgently after victory.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

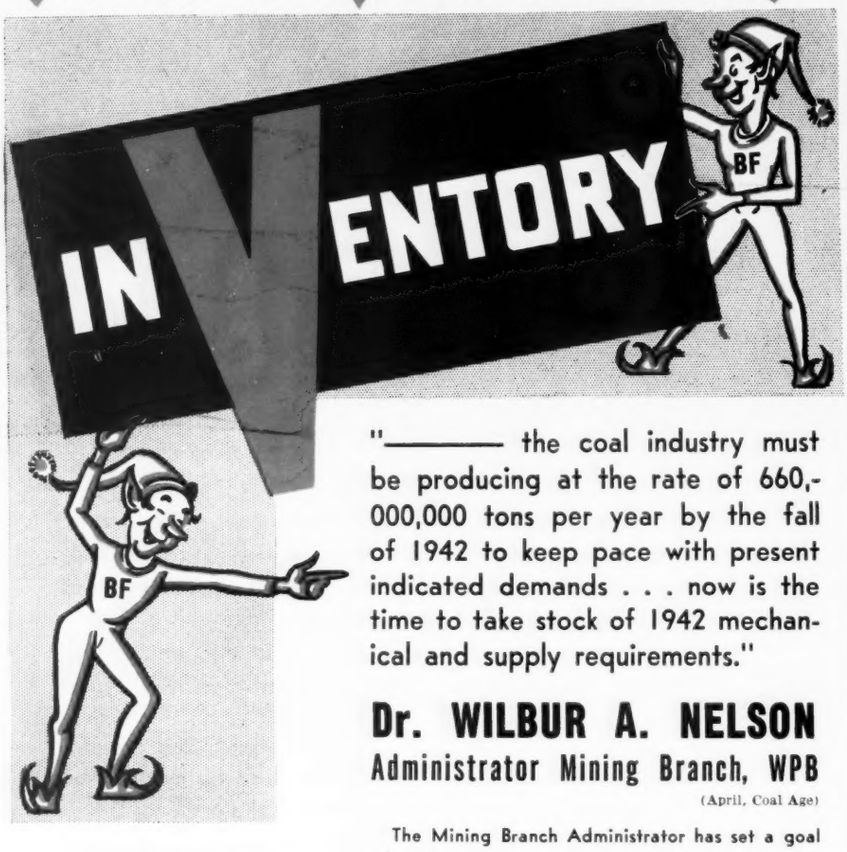
TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

Manufacturers of Timken Tapered Roller Bearings for automobiles, motor trucks, railroad cars and locomotives and all kinds of industrial machinery; Timken Alloy Steels and Carbon and Alloy Seamless Tubing; and Timken Rock Bits.

"Now is the Time!"



"——— the coal industry must be producing at the rate of 660,000,000 tons per year by the fall of 1942 to keep pace with present indicated demands . . . now is the time to take stock of 1942 mechanical and supply requirements."

Dr. WILBUR A. NELSON
Administrator Mining Branch, WPB
(April, Coal Age)

The Mining Branch Administrator has set a goal of coal tonnage necessary to American Industry's Victory Production. This goal can be met and Brown-Fayro stands ready to help you.

Down-in-the-mine "Brownies" are helping to speed production today. However, more will be needed to meet the even greater demands that will come.

To help you get the hoists, blowers, pumps and other equipment that will be needed we ask that you mentally check your needs for this year and next on the accompanying list. Tell our representative what you'll need and when you'll need it—or better yet write us today—"Now is the Time"

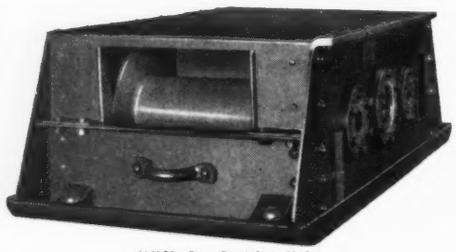
Victory *can* be found in the proper inventory and the necessary follow-thru!

Refer to our ad on pages 48, 103, 123 of The Coal Mining Catalog

Check your Inventory Now for "Brownie";

- Hoists
- Blowers
- Pumps
- Retarders
- Mine Cars and Wheels
- Rerailers
- Sheaves

THE BROWN-FAYRO COMPANY
940 ASH STREET . . . JOHNSTOWN, PA.


HKM Car Spotting Hoist

BC Tubing Blower

C. A. Herbert, supervising engineer, U. S. Bureau of Mines, Vincennes, Ind., and B. E. Schonthal, secretary, Illinois Mining Institute, enjoy the Ohio riverfront.

5. Water is satisfactory only in a minority of cases.
6. Wetting agents break down surface tension.
7. Wetting agents reduce required liquid 50 to 75 percent.
8. Sprays are economical; fine sprays are best.
9. Spray devices will soon be a part of the machine.

Application

1. Start on a small scale.
2. Find the dust-producing spot—work on it.
3. Use a turbine pump; it has better life.
4. Build your own tanks.
5. A pressure of 75 lb. is best.
6. Wet the dust in suspension.
7. Place nozzles 24 to 28 in. from the dust treated.
8. Use solid cone nozzles for cutting machines.
9. Use sheet spray for loading machines.
10. Use several sprays on each side of car dumpers.

C. A. Herbert, supervising engineer, Bureau of Mines, Vincennes, Ind., reviewed the instructions, responsibilities and routine in handling mine explosives under the Federal Explosives Control Act.

The exacting regulations for possession and accounting, which must be explained to each employee whose duties require him to handle or account for explosives, were pointed out.

Special attention was called to the requirement that no more than the day's needs were to be issued. The suggestion was made that a separate explosives box be supplied to each loading unit.

•

Roof Fall Kills Two Foremen

Alex Wright, 34, and Albert Willston, 34, mine foremen in the West Side mine of the Blue Diamond Coal Co., Blue Diamond, Ky., were killed April 25 by a roof fall. The foremen took a crew of nine into the mine to remove dangerous top. As they prepared to drill part of it that could not be pulled off with picks the entire top fell, crushing Messrs. Wright and Willston.

SAVE STEEL FOR SHIPS AND SHELLS
— The —
More Service You Can
Get Out of Your Wire Ropes,
the More Steel You Save for
Other Vital Uses

In the interest of our present National Emergency, we offer the following suggestions:

1. **Keep your wire rope using equipment in good condition. Sheaves should be of proper size, design, material — and free from corrugations. Keep all sheaves and idlers properly lubricated and in line. Avoid excessive fleet angles.**

2. **Keep your wire ropes thoroughly and correctly lubricated.**

3. **Avoid kinks and sudden jerks . . . also, avoid cross-winding on drums, and reverse bends if possible.**

4. **Make sure your wire ropes operate with an adequate factor of safety. If there is not a proper ratio between the strength of the rope and the maximum load to be handled, the rope may be overstressed — a condition no rope can long survive.**

5. **Use wire rope of the correct size, construction, type and grade for your particular conditions.**

The foregoing suggestions are necessarily brief. We shall be glad to give further particulars to any one interested.

A. LESCHEN & SONS ROPE CO.

WIRE ROPE MAKERS — ESTABLISHED 1857

5909 KENNERLY AVENUE — ST. LOUIS, MISSOURI, U.S.A.

NEW YORK . . . 90 West Street
CHICAGO . . 810 W. Washington Blvd.
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PORTLAND . . 914 N. W. 14th Avenue
SEATTLE . . 3410 First Avenue South

The WILLISON Mine Car Coupler has been designed to provide AUTOMATIC coupling of mine cars, and to speed up the hauling and dumping operations to keep pace with modern mechanized mining methods.

Thru 10 years of service in mechanized mines Willison Automatic Couplers have shown—increased production—lower operating costs—reduction of maintenance cost—and fewer accidents.

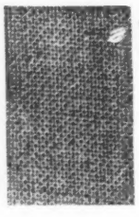
Willison Couplers allow rotary dumping of cars in train without uncoupling.

Furnished with either spring or friction draft gear for any type of car.

NATIONAL MALLEABLE & STEEL CASTING CO.
CLEVELAND . . . . . OHIO

HELPING IN THE INDUSTRY'S WAR EFFORT

. . . BY PROVIDING LONGER LIFE . . .
. . . BY ASSURING DEPENDABLE SAFETY SERVICE . . .



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COTTON BRATTICE CLOTH

Safe ventilation, over a long period of hard, rough usage, is MOROPA Cotton Brattice Cloth's contribution to the coal industry's drive for greater war production. Dependable MOROPA . . . flame-proof, mildew-resistant, and with low porosity . . . is working 24 hours-a-day in the service of the nation's mines. A careful examination of MOROPA'S features will show you why it's accepted . . . may we send you a sample? MOROPA comes in standard widths, and in 50 and 100 lineal yd. rolls.

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Engineering Educators Plan Interesting Program

The Society for the Promotion of Engineering Education has scheduled a two-day meeting, June 27 and 29, at Columbia University, New York City, when both coal and metallurgical engineering education will be considered. Coal topics on the program, beginning at 2 p.m., June 27, under the chairmanship of J. W. Stewart, are: "Evaluation of Present-Day Mining Instruction," Edward Steidle, dean, School of Mineral Industries, Pennsylvania State College; "Specialization in Mining Education," Charles E. Lawall, president, West Virginia University; "Declining Interest in the Mining Curriculum in Eastern United States," A. C. Callen, dean, School of Engineering, Lehigh University; "Value of Extracurricular Activities to the Mining Teacher," E. A. Holbrook, dean, Schools of Engineering and Mines, University of Pittsburgh.

Keeping Step With Coal Demand

Bituminous Coal Stocks

	Thousands Net Tons Apr. 1 1942	P.C. Change From Mar. 1 1942	P.C. Change From Apr. 1 1941
Electric power utilities	13,891	+3.2	+22.6
Byproduct coke ovens	7,882	−0.08	−20.0
Steel and rolling mills	1,013	+1.9	−20.6
Railroads (Class 1)	9,883	+2.3	+13.1
Other industrials*	19,072	+2.3	+32.5
Total	51,741	+2.2	+13.5

Bituminous Coal Consumption

	Thousands Net Tons Mar. 1942	P.C. Change From Feb. 1942	P.C. Change From Mar. 1941
Electric power utilities	5,019	−2.2	+6.1
Byproduct coke ovens	7,379	+10.4	+3.1
Steel and rolling mills	957	+2.1	−6.5
Railroads (Class 1)	9,723	+9.5	+13.1
Other industries*	13,380	−0.4	+6.8
Total	36,458	+3.9	+7.1

* Includes beehive ovens, coal-gas retorts and cement mills.

Coal Production

Bituminous

Month of April, 1942, net tons	49,600,000
P.c. change from April, 1941	+720.1
January-April, 1942, net tons	188,780,000
P.c. change from Jan.-April, 1941	+35.1

Anthracite

Month of April, 1942, net tons	5,138,000
P.c. change from April, 1941	+60.7
January-April, 1942, net tons	19,527,000
P.c. change from Jan.-April, 1941	+13.5

Sales of Domestic Coal Stokers Vs. Oil Burners

	Coal Stokers	Oil Burners
March, 1942	10,972	7,839
P.c. change from March, 1941	+40.5	−30.4
January-March, 1942	24,933	29,701
P.c. change from Jan.-March, 1941	+14.8	−11.9

Index of Business Activity*

Week ended May 16 (preliminary)	178.7
Percent change from month ago	− 0.5
Percent change from year ago	+16.1

* *Business Week*, May 23.

Electrical Power Output†

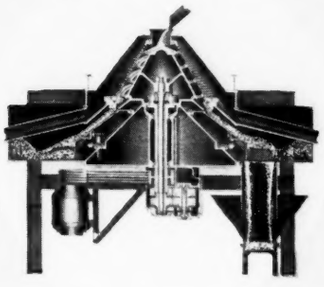
Week ended May 16, kw.-hr	3,356,921,000
Percent change from month ago	+ 1.5
Percent change from year ago	+11.5

†Edison Electric Institute.

Continuous Centrifugal Dryer used for drying fine coals.

"C-M-I" *Continuous Centrifugal* DRYER

Increases Tonnage — Saves Waste



Not only does the "C-M-I" dry coal faster and uniformly but also becomes an important factor in preventing time lost by clogging of spouts, bins, and cars.

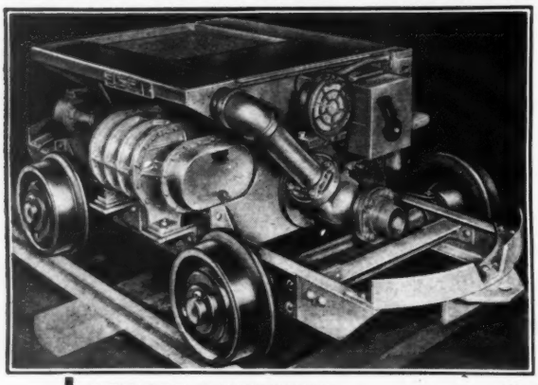
Plus this the "C-M-I" is of value in conservation of materials, power, and time. You can turn your sludge into a salable product at low cost—you can reduce moisture and ash content and remove coal from slurry. You save in installation space needs—in power—in coal consumed to operate the "C-M-I" as heat is not needed. You too save on the maintenance cost per ton of coal processed. You get results at lowest operating-cost-per-ton of dried coal.

GET details on the "C-M-I" — the economical solution to the problem of coal drying without the use of heat.

CENTRIFUGAL AND MECHANICAL INDUSTRIES, INC.

SECOND AND PRESIDENT STREETS ST. LOUIS, MO.

ANTICIPATE **ROCK DUSTER** REQUIREMENTS



PRIORITIES WILL DELAY DELIVERIES

• • • •

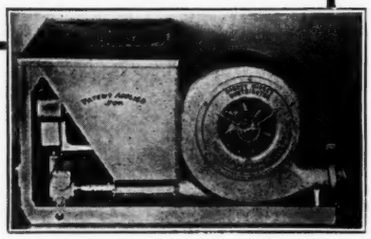
The LITTLE GIANT machine can be used on entries or areas reached with 100 ft. of hose. Compactly and rigidly built for hard service. Overall height above rail—27 in. Hopper capacity—400 lbs. Weight—1800 lbs. Easily handled on cage.

THE LITTLTE GIANT —A REAL BUY

LARGER MACHINES can be supplied for dusting entries and back areas thru 500 ft. of hose. A MACHINE FOR EVERY REQUIREMENT . . . . 30 MODELS TO SELECT FROM . . . . SEND FOR BULLETIN TODAY!

MIGHTY MIDGET

The MIGHTY MIDGET machine does a WHALE of a job. It will distribute MORE THAN A TON OF DUST PER HOUR. Can be used on Shuttle Cars or Belt Conveyors. Built for service. Hopper capacity—80 lbs.



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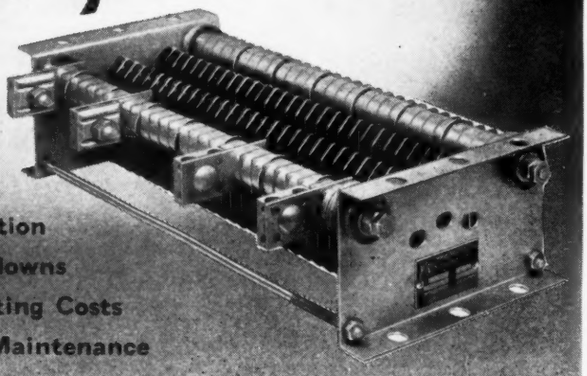
Steel Grid Resistor

for



★ More Production
★ Fewer Shut-downs
★ Lower Operating Costs
★ Less Motor Maintenance

Unaffected by Vibration, Moisture or Corrosive Fumes

P-G *"The Resistor you can Install and Forget"*

THE POST-GLOVER ELECTRIC COMPANY

• ESTABLISHED 1892 •

221 WEST THIRD STREET, CINCINNATI, OHIO

Personal Notes

WILLIAM H. BROWNE has been named a research engineer on the technical staff of Battelle Memorial Institute, Columbus, Ohio, where he has been assigned to the division of fuel research. A graduate in mechanical engineering of Renssalaer Polytechnic Institute, he was associated with the Caterpillar Tractor Co. prior to joining the Battelle staff.

THERON O. CRUISE has become mining engineer's assistant with the Pocahontas Fuel Corporation, Tazewell, Va.

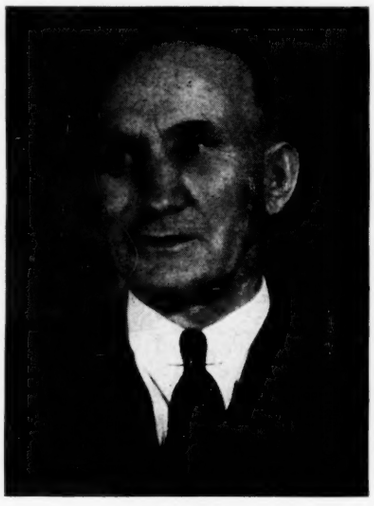
E. D. ENNEY, New York City, has been named manager of the Norfolk (Va.) office of the Hampton Roads Coal Emergency Committee, with headquarters at Norfolk. The committee is engaged in expediting the movement of coal out of Norfolk and Newport News.

E. D. FORTNEY, Koppers Coal Division of Eastern Gas & Fuel Associates, has been promoted from division electrician of Federal No. 1 mine, Grant Town, and Federal No. 3 mine, Everettville, W. Va., to general mechanical inspector of all operations. He has changed his residence from Grant Town to Fairmont.

JAMES D. FRANCIS, president, Island Creek Coal Co., Huntington, W. Va., has been reelected a director of the Chamber of Commerce of the United States and renamed to the chairmanship of the natural resources division.

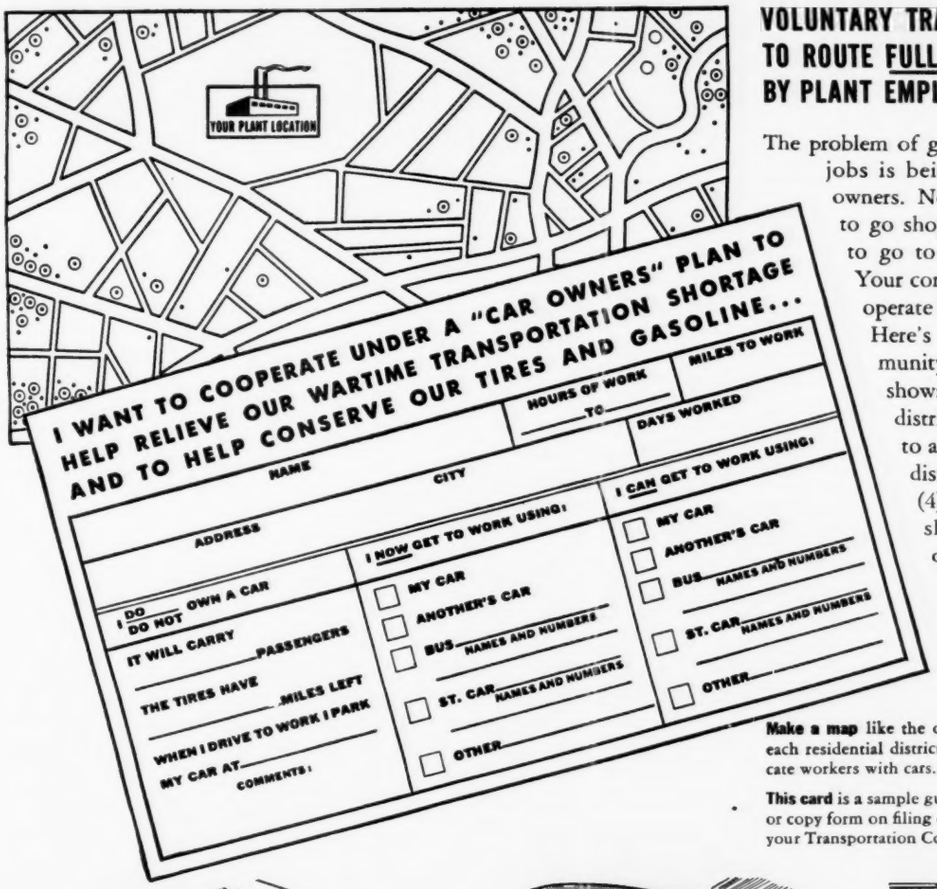
FRANK GREGORY, former manager of the Carbon Glow Coal Co., Carbon Glow, Ky., left during the week ending May 16 for Port Arthur, Texas, where he was to be inducted into the merchant marine. He formerly was in the armed service, having spent two years in Hawaii.

LEE HASKINS has retired after 54 years of service in the mining industry, the last 12 as superintendent of Zeigler No. 1 mine, Bell & Zoller Coal & Mining Co., Zeigler, Ill. When 14 years old he started in the mines as a trapper in a mine at Danville, Ill., and since that time has worked as driver, pick miner, boss driver, assistant mine manager,



Lee Haskins

MANY LARGE COMPANIES ARE NOW TAKING A CENSUS OF EMPLOYEES' CARS AS PART OF NATION'S PROGRAM TO GET 40,000,000 WORKERS TO THEIR JOBS ON TIME



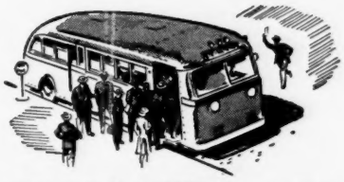
VOLUNTARY TRANSPORTATION COMMITTEES TO ROUTE FULL CARS TO WORK ARE SET UP BY PLANT EMPLOYEES IN EACH COMMUNITY

The problem of getting 40,000,000 workers to their jobs is being taken over by America's car owners. Neighbors are already doubling up to go shopping, to take children to school, to go to work . . . *but not enough of them!* Your company and your employees can cooperate by taking a census of workers' cars. Here's how you can do it in your community: (1) Fill out cards, like the one shown here, (2) Sort cards by residential districts, (3) Select sectional committees to act as traffic control groups for each district to assure equitable use of cars, (4) Route *full* cars to work on every shift. Details can be worked out quickly by you . . . your workers . . . your community. The important thing is to start today to get every last mile of use from our cars, our gas, our tires!

Make a map like the one above, on which to chart the routes for each residential district. Dots indicate workers' homes; circles indicate workers with cars.

This card is a sample guide. Make changes to suit your needs. Reprint or copy form on filing cards for each worker to fill out and turn in to your Transportation Committee.

Trolleys can't do it ALONE. Even with staggered work hours to level off transportation peaks there aren't enough trolleys to take America's millions to work.

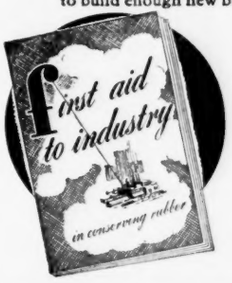


Buses can't do it ALONE. They're already taxed to their full seating capacity. And enough vital steel and rubber can't be spared to build enough new buses.

Trains can't do it ALONE. Although every railroad is cooperating 100%, many of America's mighty war production plants can't be serviced by trains or subways.

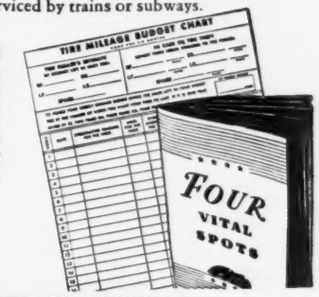
HOW TO CONSERVE MECHANICAL RUBBER GOODS

This 48-page book is for managers, engineers and plant operating men. It shows how you can conserve rubber through proper handling, installation and care of rubber conveyor, elevator and transmission belts; all types of industrial hose; packings; linings; rolls; mountings; and other mechanical rubber goods; and electrical wires, cables, and tapes. For free copies, write directly to Mechanical Goods Division, United States Rubber Company.



GET FREE MILEAGE BUDGET CHARTS

and copies of this free 32-page book on tire care from your local U. S. Tire Dealer or write direct to the United States Rubber Company. Hundreds of thousands of these charts and books are already in the hands of American car owners — helping to save tires, gas and oil.



IN AMERICA'S FIGHT FOR LIFE, EVERY TIRE-MILE MUST BE SAVED FOR ESSENTIAL DRIVING

UNITED STATES RUBBER COMPANY

1230 Sixth Avenue • Rockefeller Center • New York

mine manager, superintendent and general superintendent in many of the coal fields in Illinois and Indiana. His long official career began when he was made boss driver in the Danville field for Jones-Adams Co., which later transferred him to its Springfield mine as assistant mine manager. Later he served as mine manager for the Southern Coal & Coke Co. at Belleville, Marion County Coal Co. at Centralia, and Peabody Coal Co., at Kincaid No. 7. Prior to going to Zeigler he had spent several years as superintendent and general superintendent for J. K. Dering and the Cosgrove-Meehan Coal Co.

JOHN P. HOWELL has been promoted from shift foreman to assistant superintendent of the River Seam Coal Co., Booth, W. Va.

WILLIAM M. LACEY, formerly superintendent at the Wylam mine of the Tennessee Coal, Iron & Railroad Co., Fairfield, Ala., has been named general superintendent of the Republic Steel Corporation coal mines, Sayreton, Ala.

EUGENE MCAULIFFE, president of the American Institute of Mining and Metallurgical Engineers as well as of the Union Pacific Coal Co., has been appointed on the Fritz Medal Board of Award.

MCHENRY MOSIER, senior mining engineer, U. S. Bureau of Mines, College Park, Md., has been transferred to the Bureau's mining division, Washington, D. C., as assistant chief.

ERNEST PRUDENT has been promoted to the position of superintendent of Bell & Zoller Coal & Mining Co.'s Zeigler No. 1 mine, Zeigler, Ill., following the resignation of LEE HASKINS, who held that post for many years. ANDREW MCMURTRIE has been advanced to chief electrician, vice Mr. Prudent.

MURRELL REAK, West Frankfort, has been appointed a member of the Illinois Mining Board, representing the United Mine Workers. He fills a vacancy caused by the death of JOHN MENTLER, Centralia. BYRON O'NEAL, Staunton, was named recently to represent the Progressive Miners.

LOUIS REESE, hitherto with the Utah Fuel Co., Castle Gate, Utah, has been appointed superintendent and engineer of the Liberty Fuel Co., Latuda, Utah.

J. D. ROGERS, vice president and general manager, Stonega Coke & Coal Co., has been named president of the Virginia Coal Operators' Association.

HENRY G. SCHMIDT is to become chairman of the board and chief executive officer of the North American Coal Corporation, Cleveland, Ohio, on July 1. For the last 15 years he has been general manager of the Wheeling Township Coal Mining Co., subsidiary of the Goodyear Tire & Rubber Co., operating at Adena, Ohio. He also has been manager of the engineering staff, in charge of construction work of the parent company and its subsidiaries. He is a graduate mechanical engineer of the University of Kansas.

M. A. SHARP, mine foreman at the Clark mine of the Union Pacific Coal Co., Superior, Wyo., has been appointed assistant superintendent and transferred to Reliance, Wyo.

KARL M. SUDER, chief traffic officer of the Akron, Canton & Youngstown R.R., has been lent by that company to fill the post of vessel coordinator to facilitate the movement of coal and iron ore on the Great Lakes. He has established headquarters at 2010 Terminal Tower, Cleveland, Ohio.

WILLIAM D. TYLER has retired as land engineer with the Clinchfield Coal Corporation, Dante, Va., and has taken up residence in Media, Pa.

WALTER N. WETZEL has resigned as general superintendent for the United States Fuel Co., Hiawatha, Utah, to become superintendent of mines and coke ovens for the Utah Fuel Co., Sunnyside, Utah.

RUSSELL WOODALL has been promoted from superintendent at Mohican mine of the Allegheny River Mining Co., Kittanning, Pa., to general superintendent of the company with office in the Shawmut Building, Kittanning, Pa. He has been in the service of the company 14 years, receiving successive promotions in supervisory positions at the Cadogan and Mohican mines. CLYDE A. CROOKS has been appointed to succeed Mr. Woodall as superintendent at Mohican.

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Obituary

JUDGE JAMES P. LEWIS, 72, president of the Sandlick Coal Co., political leader and educational worker, died May 22 in the Hazard (Ky.) hospital after a three weeks' illness. Early in life he entered politics, holding several offices, including Secretary of State and State Banking Commissioner under Governor Edwin P. Morrow.

EDWARD COOPER JR., 45, formerly president of the McDowell Coal & Coke Co., died May 17 in a hospital at Bluefield, W. Va., after a brief illness. His father was one of the developers of the Pocahontas coal field.

HUGH NEEDHAM, 62, president of the R. T. Davis Coal Co., Jackson, Ky., died May 12 following a long illness. He joined the coal company in 1915.

Class in Mining Sponsored by Mayo State Vocational School

This group, at Paintsville, Ky., which on the evening when the picture was taken studied chemical analysis of mine air, included mine superintendents, foremen and assistant foremen from Utilities Elkhorn Coal Co., Mines Nos. 5 and 8; Katherine Elkhorn Coal Co., Sampson Elkhorn Coal Co., Turner Elkhorn Mining Co. and Sizemore Mining Co.

Eastern Fuel Oil Deliveries Further Limited

Gist of the text of the order placing additional limitations on fuel oil, as provided in amended Order L-56 (see story on another page), is as follows:

"No supplier shall deliver or cause to be delivered and no person shall accept delivery of fuel oil or any other petroleum product for use in the operation of coal-spraying equipment at or in any place in the United States.

"Within Area 1 (Atlantic Seaboard States, except certain inland counties), no supplier shall deliver or cause to be delivered and no person shall accept delivery of fuel oil in any one month for use in the operation of space and central heating and cooling equipment in excess of 50 percent of the amount of fuel oil delivered to such person for such use during the corresponding month in the year 1941: Provided, That if deliveries to such person for such use during the corresponding month in the year 1941 were abnormally high or low or if there were no deliveries during the corresponding month in the year 1941, then the supplier or suppliers of such person shall deliver to such person an amount equal to 50 percent of the fuel oil that is required for such use in the normal operation of such equipment: And provided further, That the foregoing limitations may be exceeded to the minimum extent necessary for the operation of equipment used in connection with industrial processes, or research operations, requiring temperature control."

For use in the operation of domestic and commercial water-heating equipment, limitations similar to those set forth in the preceding paragraph are provided.

•

Employees Take Over E.T.L.

Electrical Testing Laboratories, New York City, has been taken over by its employees and, as of May 1, the new organization is known as Electrical Testing Laboratories, Inc.

Bureau of Mines Approvals

Two approvals of permissible equipment were issued by the U. S. Bureau of Mines in April, as follows:

Goodman Manufacturing Co.—Type 91-C-17 chain conveyor; 10-hp. motor, 230 volts, d.c.; Approval 447; April 18.

Jeffrey Manufacturing Co. — Type L-600 loader; 50-hp. motor, 250 and 500 volts, d.c.; Approvals 448 and 448-A; April 9.

Call to War Service Issued By Stevens Institute

Following announcement of its war-time program, under which the college will remain in session the year around and students will spend two 17-week terms studying and one term each year working in war industries to help meet the shortage of engineers, Stevens Institute of Technology, Hoboken, N. J., has issued "A call to war service to young men about to enter college in 1942." The call was contained in a letter from Dr. Harvey N. Davis, president of Stevens, which will be distributed widely to high schools and preparatory schools and personnel officers of industry.

"This country needs technically trained men in its war production industries even more than it needs fighters in its Army and Navy," President Davis wrote. "Stevens invites you to begin to get this technical training early this summer, and while you are getting it, to begin, almost at once, to use it in helping to win the war. Each year will be divided into three terms, as follows: fall term—Sept. 28, 1942, to Jan. 23, 1943; spring term—Jan. 25, 1943, to May 22, 1943; summer term—May 24, 1943, to Sept. 25, 1943.

"Each member of the class of 1946 will spend two of these terms each year studying on the Stevens campus and one of them working in a war industry or on some other job useful to the country's war effort. One third of the class will be in industry during each term. This experience in industry will help you get more out of your college work. It is, furthermore, the quickest way we know of for you to get actively into helping win the war while preparing yourself for still more effective service later on."

•

Gay Company Starts Operations

A railroad car loaded with clean coal from a 7½-ft. seam rolled from beneath the tipple on May 4, marking the beginning of operations of the Gay Mining Co. plant at Timbar, on Ben Creek, near Gilbert, W. Va. C. K. Robertson is president and Harry S. Gay Jr. is vice president and general manager of the company, which has 2,000 acres of land leased from the United States Steel Corporation and the Gilbert Land Co.

Supervising loading of the first car of coal were Tom Gilpin and Don Ellis, who in 1904 assisted in opening the Gay Coal & Coke Co. mine at Mount Gay, fostered by Harry S. Gay Sr., father of the vice president of the new company. Both companies have the same staff of officials.

ROEBLING

VARNISHED CAMBRIC
BORE HOLE CABLE

SAVES RUBBER!

War sounds the call for coal—and more coal! So down goes a new high-tension circuit, to take more power to the underground workings. And, to save rubber, this mine has specified Roebling Varnished Cambric Bore Hole Cable.

KNOW YOUR CABLES! SPECIFY RIGHT FOR VICTORY

Here's how Roebling Bore Hole Cables are made:

Single conductor sizes 2,000,000 to No. 6 A.W.G.
Multiple conductor sizes 750,000 to No. 6 A.W.G.

The conductors are plain copper fabricated to conform to A.S.T.M. Specifications B-1; B-2; B-3 and B-8 as required.

The wall of insulation is built up of successive layers of helically laid varnished heat resistant cambric tapes and a fibrous tape covering. Maximum operating temperature 85°C.

Where moisture conditions are not severe, a reinforced weather resisting jacket is applied. For severe moisture conditions a lead sheath is necessary

For end suspension the weight of multiple conductor cable is carried by high strength heavily galvanized steel armor wires. Single conductor cable is carried by non-inductive armor of copper or bronze wire. The armor wires are laid over thoroughly impregnated jute bedding. If desired, a fibrous covering will be supplied over the armor wire to protect it from abrasion during installation. Prompt shipment of war orders.

JOHN A. ROEBLING'S SONS COMPANY
TRENTON, NEW JERSEY • Branches and Warehouses in Principal Cities

WEST VIRGINIA TRACK EQUIPMENT IS GOOD . .

TRACK WORK TIPS

Track troubles and remedies.

FAILURE	CAUSE	REMEDY
Spread gage	On wood ties—insufficient spiking or worn out ties. If on steel ties—tie spacing too great	Properly spike, replace ties or apply gage rods. Shorten tie spacing
Broken switch points	Poor alignment, poor support, loose joints	Set to alignment and spread, install switch plates for proper support.
Split frog points	Usually by rerailing cars in crotch of frog	Discontinue practice or install heel or rerailing block in frog
Hammered down joints	Wet road bed, pumping ties, loose joints, gap between rails	Proper drainage, new ties properly tamped, tighten joints, install new rail to close joints
Derailments at Turnouts	Too sharp for length of wheel base, uneven surface, bad alignment, loose joints	Use longer turnouts, smooth bottom or ballast to level up; install to proper alignment.

... and correct installation makes it even better!

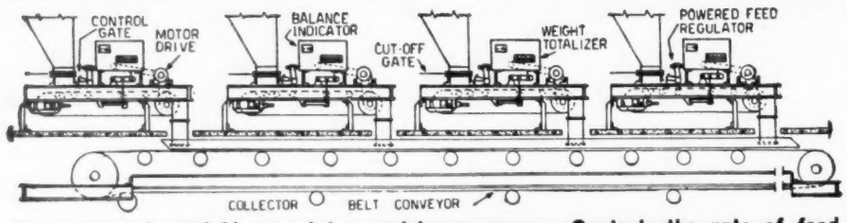
Modern mining demands the best materials, workmanship and design in track work. West Virginia builds high grade, modern track work and their Engineers are glad to give you obligation free consultation service.

Everything in Trackwork

THE WEST VIRGINIA RAIL CO.

HUNTINGTON WEST VIRGINIA

FEEDOWEIGHT



For accurately weighing coal to a mixing conveyor—Controls the rate of feed and continuously totalizes the weight delivered

MERRICK SCALE M'FG. CO., Passaic, New Jersey

W. R. Godber Named Manager Of Tidewater Bureau

The Tidewater Bureau, a voluntary organization, has been created by anthracite and bituminous coal transshippers over the New York tidewater piers. The bureau was established at the suggestion of the Interstate Commerce Commission and the Car Service Division of the Association of American Railroads, in order to expedite the vital rapid turn-around movement of railroad cars at terminal piers and to assist the railroads in meeting the increased demands for transportation due to the war effort.

The new bureau will compile statistics concerning cars of coal standing or held at tidewater piers serving the Eastern Seaboard markets and will take action to prevent undue detention of such cars. It is thought that it will serve a useful purpose in bringing about more efficient utilization of railroad equipment as well as boats and barges at a time when this is one of the nation's most urgent requirements.

Under the direction of W. R. Godber, recently appointed manager, with offices at Room 2902, 19 Rector St., New York City, the bureau will be separated into two branches: the Anthracite Tidewater Emergency Bureau and the Northern Tidewater Bituminous Emergency Committee. The chairman of the Anthracite Industry Committee is C. J. Goodyear, traffic manager, Philadelphia & Reading Coal & Iron Co., and the secretary-treasurer is Louis C. Madeira 3d, executive director, Anthracite Institute. The chairman of the bituminous committee is Charles O'Neill, president, United Eastern Coal Sales Corporation, and the secretary is Walter A. Jones, secretary, Central Pennsylvania Coal Producers' Association, Altoona, Pa.

•

Closed Shop Pact Signed

A closed-shop wage contract covering about 3,800 miners employed in the Lynch (Ky.) operations of the United States Coal & Coke Co., United States Steel Corporation subsidiary, has been signed and approved by the United Mine Workers, according to William Turnblazer, president of District 19, U.M.W. There was only one dissenting vote by the Lynch local, largest in the U.M.W., said Mr. Turnblazer. T. J. McFarland, general superintendent, signed the contract for the company.

•

New Preparation Facilities

Ames Mining Co., Fayette, W. Va.—Contract closed with Fuel Process Co. for washer installation to clean 50 tons per hour of stove coal.

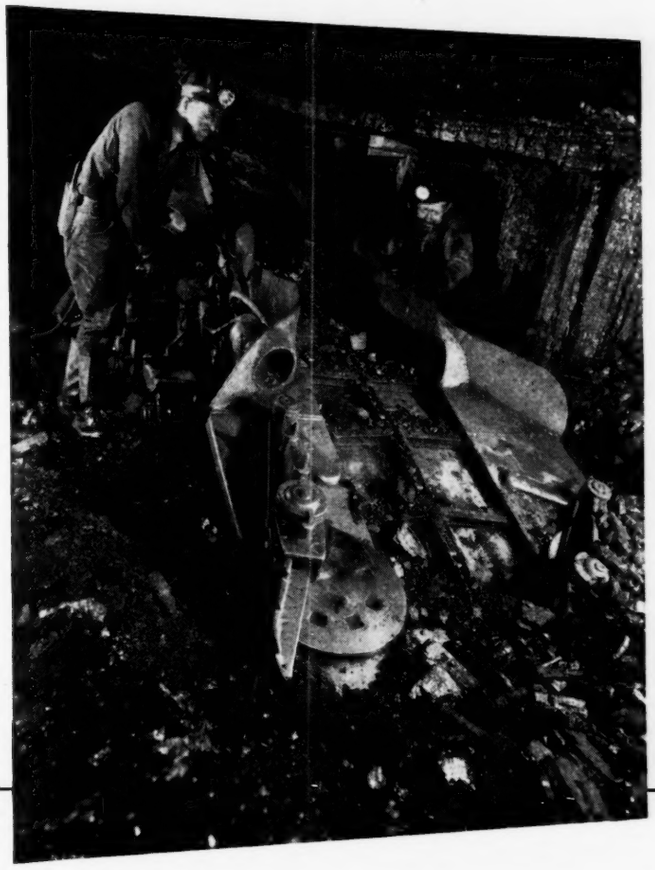
Gulf Mining Co., Crab Orchard, W. Va.—Contract closed with Fuel Process Co. for washer installation to clean 40 tons per hour of stove and nut coal.

Lillybrook Coal Co., Big Stick, W. Va.—Contract closed with Fuel Process Co. for washer installation to clean 60 tons per hour of stove, nut and pea coal.

United States Coal & Coke Co., No. 13 Plant, Moses, W. Va.—Contract closed with Kanawha Mfg. Co. for dumping and conveying equipment consisting of Kanawha power rotary dump with shield and hopper, 42-in.-

"GULF LUBRICATION *is a proven aid to greater production*"

SAY MINE OPERATORS



Loaders perform better and stay on the job longer when their moving parts are protected by the proper Gulf quality lubricant.

"With Gulf Engineering Service and Gulf Quality Lubricants we secure more efficient equipment performance and fewer mechanical delays — which add up to increased output."

"RECENTLY we adopted a lubrication policy that has been a big help to us in meeting demands for greater tonnage," says a mine Superintendent. "First, we called in a Gulf engineer. Then we standardized on the quality lubricants and application methods he recommended. Result: a reduction in equipment 'down' time for overhauls and repairs, and an increase in mine output."

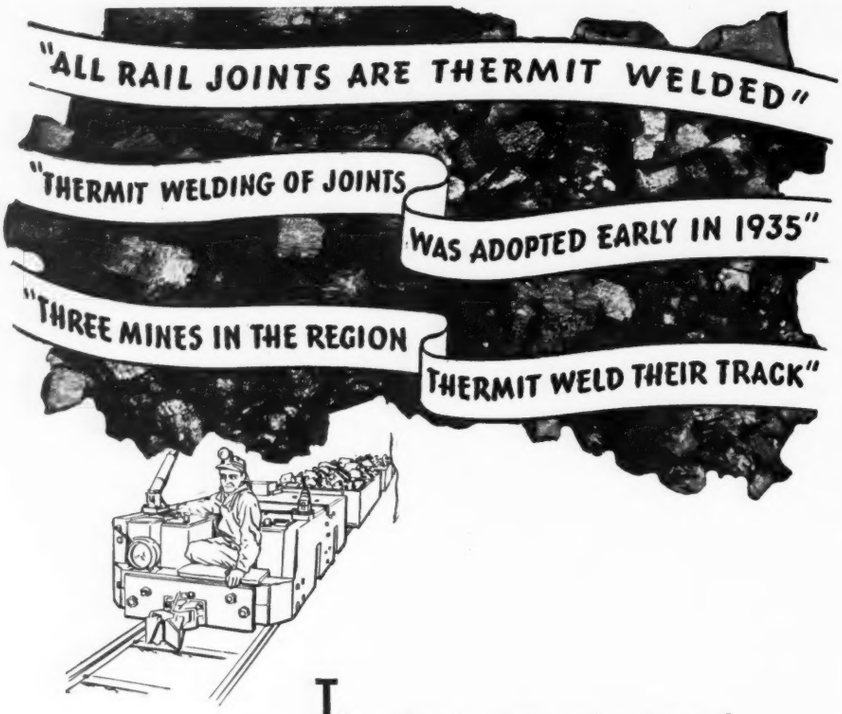
Scores of mine operators testify to the economies and production improvements which accompany the best lubrication practice — the kind of lubrication practice you can install by allowing a Gulf engineer to work with you on your lubrication problems. His helpful engineering counsel, plus the proper lubricants from Gulf's complete line, will insure more efficient and more dependable performance from your equipment, and minimum expenses for maintenance and repairs.

The services of a Gulf engineer—and the Gulf line of more than 400 quality oils and greases—are quickly available to you through 1200 warehouses located in 30 states from Maine to New Mexico. Write or 'phone your nearest Gulf office today.

GULF INDUSTRIAL LUBRICATION

GULF OIL CORPORATION
GULF REFINING COMPANY
GULF BUILDING · PITTSBURGH, PA.

OIL IS AMMUNITION — — USE IT WISELY!


"ALL RAIL JOINTS ARE THERMIT WELDED"
"THERMIT WELDING OF JOINTS WAS ADOPTED EARLY IN 1935"
"THREE MINES IN THE REGION THERMIT WELD THEIR TRACK"

IN reading descriptions of modern coal mines, one constantly comes across references to Thermit welding of main haulage track.

For in the continuous effort to streamline operations and cut costs, Thermit welding is recognized as an important factor.

Careful cost records have shown that, over the life of the track, Thermit welding has cut the cost of a joint by more than 20%, compared with an angle-bar and bond joint.

Longer rail life, due to absence of wear on rail ends, smoother operation of cars, and less wear and tear on rolling stock are other advantages of Thermit welded track.

★★★ **VICTORY NOTE** ★★★

Tremendous demands for aluminum for war production have caused a temporary shortage of Thermit for rail welding. You will want to keep this ideal rail joint in mind for the future, if you cannot get Thermit today.

METAL & THERMIT CORPORATION

120 BROADWAY • NEW YORK, N. Y.

ALBANY • CHICAGO • PITTSBURGH • SO. SAN FRANCISCO • TORONTO

Specialists in welding for nearly 40 years. Manufacturers of Murex Electrodes for arc welding and of Thermit for repair and fabrication of heavy parts.

wide apron feeder, 668 ft. rope-and-button conveyor and two 42-in. belt conveyors; capacity 300 tons per hour of mine-run coal.

WEST VIRGINIA COAL & COKE CORPORATION—Contract closed with Fairmont Machinery Co. for dust-collecting equipment to replace existing equipment; to be installed Sept. 1.

•

Reyerson Makes Hydrogen By Heating Lignite

Lignite may be used as a source of hydrogen and ammonia. By crushing it and passing it through a long vertical tube heated to about 1,300 deg. F., the moisture in the lignite is evaporated as steam, with which the carbon promptly reacts, removing oxygen and letting hydrogen escape. This hydrogen may be made to react with nitrogen to form ammonia.

This means of obtaining hydrogen from the 25 to 40 per cent of moisture in the lignite was discovered and patented recently by Lloyd H. Reyerson, of St. Paul, Minn., and Donald C. Gernes, of Minneapolis, Minn., and is covered by patent No. 3,276,454.

•

Reconsideration of Wage Rise Tabled in Nova Scotia

The National War Labor Board of Canada has ruled that reconsideration of applications for wage increase made by the United Mine Workers on behalf of Nova Scotia miners is not justified, it was revealed in correspondence tabled in the Dominion House of Commons on May 13 on motion of M. J. Colwell, C.C.F. House leader. The decision was made known in a letter dated May 6, in response to representations made by union officials to members of the War Labor Board executive committee.

In a letter to union officials, R. H. Neilson, secretary of the Board, wrote: "The Board has decided that reconsideration of the very complete information and data carefully considered already by the Board is not now justified and that its finding and direction must necessarily stand." Workers involved are employed by the Dominion Coal Co., Acadia Coal Co., Old Sydney Collieries, Ltd., and the Cumberland Coal Co.

In its findings the Board said it had not been shown that the basic scale of wages was low within the meaning of the government's wage order. Cost-of-living bonuses being paid were properly calculated, the Board ruled. The Board requested that its findings be included in a new agreement between the operators and workers, to continue in force until one year after the end of the war.

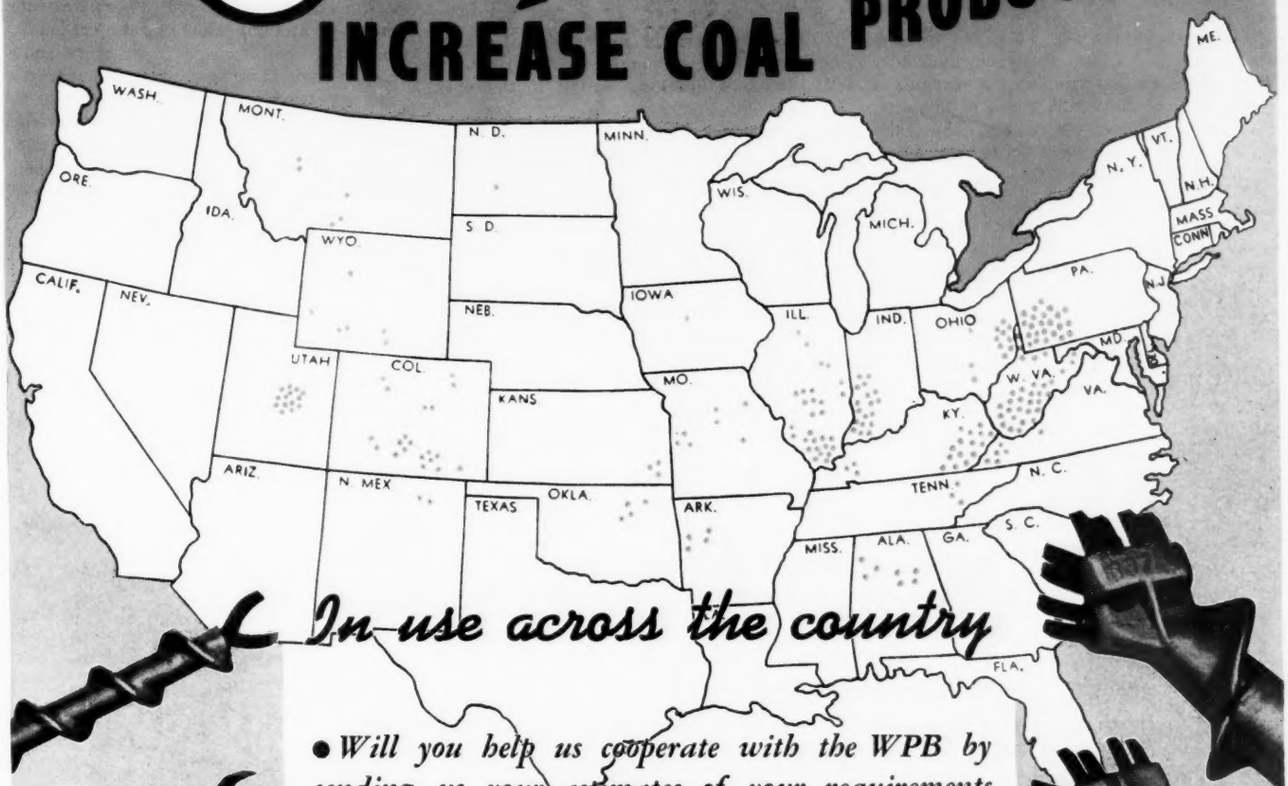
•

Mine Long Idle Reopens

Ruth mine of the Black Beauty Coal Co., Shamrock, Pa., was reopened late in April, with shipments scheduled to start on May 25. The operation was prominent among the Rockwood fields of Somerset County until 1932, when the plant was shut down. J. F. Neilan, president of the company, said that between 70 and 80 men would be employed and daily production was expected to reach 400 tons.

COALMASTER *Tools*

INCREASE COAL PRODUCTION



In use across the country

● *Will you help us cooperate with the WPB by sending us your estimates of your requirements for the second half of 1942?*

COALMASTER TOOLS FOR INCREASED EFFICIENCY

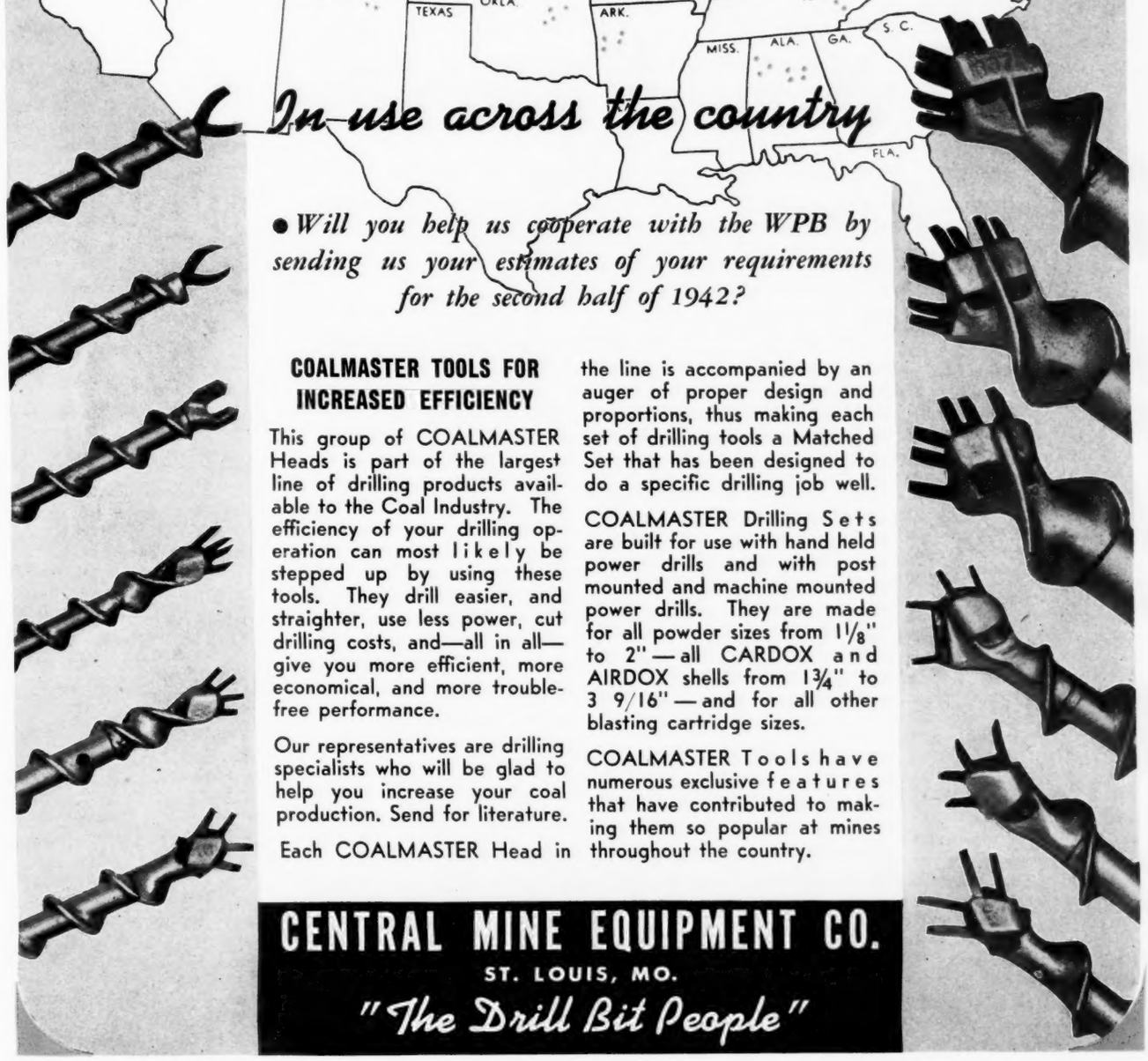
This group of COALMASTER Heads is part of the largest line of drilling products available to the Coal Industry. The efficiency of your drilling operation can most likely be stepped up by using these tools. They drill easier, and straighter, use less power, cut drilling costs, and—all in all—give you more efficient, more economical, and more trouble-free performance.

Our representatives are drilling specialists who will be glad to help you increase your coal production. Send for literature.

Each COALMASTER Head in the line is accompanied by an auger of proper design and proportions, thus making each set of drilling tools a Matched Set that has been designed to do a specific drilling job well.

COALMASTER Drilling Sets are built for use with hand held power drills and with post mounted and machine mounted power drills. They are made for all powder sizes from 1⅛" to 2"—all CARDOX and AIRDOX shells from 1¾" to 3 9/16"—and for all other blasting cartridge sizes.

COALMASTER Tools have numerous exclusive features that have contributed to making them so popular at mines throughout the country.



CENTRAL MINE EQUIPMENT CO.

ST. LOUIS, MO.

"The Drill Bit People"

War-Conscious Coal Congress Attacks Operating Problems at Cincinnati

(*Continued from page* 58)

drilled, each with a 1-in. hole, and in each was placed 25 grams of 40-percent dynamite. When there was no tamping, the expansion was 367 cu.cm. With 6.25 grams of tamping, the expansion was 506 cu.cm. Thus, the explosive, when one-fourth as much tamping as explosive was added, increased 38 percent in efficiency.

Shots were fired at three charges of dynamite with a 22-caliber rifle, said R. D. Leitch, in charge of Explosives Licensing, U. S. Bureau of Mines, and one of the three exploded; the other two spread without exploding. The action of explosives is uncertain, so care always should be taken.

To Seal or Not to Seal Wastes—One of the first to seal abandoned working places was the Knox Consolidated Coal Corporation, Bicknell, Ind., said Walter E. Buss, that company's mechanical engineer. The practice was initiated in 1915. During the more than 26 years since that time 200 seals have been constructed at this mine alone, and the practice then begun, not without qualms, has become regular and routine procedure, about on a par with building of overcasts.

Back in 1915, bottling up acres upon acres of methane and other noxious gases in fairly close proximity to live workings involved disturbing possibilities. Suppose (1) should, by accident or carelessness, adjoining workings be allowed to breach one of these sealed panels with its load of entrapped gases, or (2) should the weight of the overburden crush an intervening coal pillar or the seal itself and release the threatening gases from confinement or (3) should an external explosion blow out one of these seals, thereby heaping further havoc on a situation already bad, or (4) should the confined areas fill with water, and hydraulic pressures add their force to the gases sealed within and overpower the stopping, what would happen? All these are valid possibilities and must be reconciled with safe practice for sealing to be practicable.

Safety Elements in Sealing—On the other hand, ventilation and inspection of these areas will be impossible by reason of roof falls. Sudden emissions of gas due to further caving or to interrupted ventilation or simply to a lowering of the barometer always will be faced if the wastes are not sealed. Every open place will have to be inspected by a fireboss every day and 365 days a year, an ever-increasing task, requiring no less than an army of firebosses, yet safety would not be in any way assured. Again there is the possibility of gob fires within the inaccessible depths of these panels—gob fires in the near presence of methane. Thus one has a choice of one of two evils.

No Choice in Harlan County—Sealing of abandoned areas has been forced by circumstances on the mines in the Appalachians, declared James F. Bryson, director of safety, Harlan County Coal Operators' Association, Harlan, Ky. With oxygen reduced to 12.1 percent no explosion or combustion is possible. In Harlan County the cover is not 300 ft. deep but 2,000 ft. and more. The law requires that areas be inspected that cannot be entered and it therefore is a nullity. In Mr. Bryson's opinion, sealing is the only solution.

A gooseneck should be provided below seals where there is water, asserted Mr. Leitch, so as to let out water and yet seal the air. He had tried to inspect an area supposed to be sealed and found the inspection was impossible and had not for some time been attempted. The concrete-block stoppings had been broken down by an inspector to facilitate his return to live operations. Water from behind such a seal would be alkaline. It had been used for coal washing, but, in one case that he recalled, after much water had been used, the water became acid, having a pH of 6.4.

Saxton No. 1 mile, stated Birch Brooks, mine superintendent, Walter Bledsoe & Co., Terre Haute, Ind., has 184 concrete seals, each costing $600. These have been built since the shaft was sunk in 1922.

Use of Wetting Agents—For about five years, the Koppers Coal Division, Eastern Gas & Fuel Associates, Kimberly, W. Va., declared James C. Johnston, general inspector, has been using water to spray coal, the interfacial surface tension of which has been reduced by a chemical agent manufactured by the Midland Sealtite Corporation. The first installation was made on a tipple, and since that time sprays have been used extensively on crushers, outside dumps and mining machines.

Difficulties With Treated or Untreated Water—If at a mine dump or at a car-loading point, the coal drops 3 ft. or more and a current of air is present, water, if not treated with a wetting agent, will not penetrate the coal stream nor spread on the dust particles. Application of 4 or 5 gal. of water per ton of coal, though it will wet most of the coal, will still leave dust in suspension. At elevators loading into mine cars and at transfer points from room conveyors to mother conveyors, as much liquid, whether merely water or treated water, may be applied regardless of the flow or stoppage of coal. Automatic control is not feasible, for equipment for that purpose cannot be made both delicate enough to respond to differences of flow and rugged enough for mine use.

If bar and bits of a mining machine are wetted on the ingoing side, the dust is so dampened that it is not suspended in the air. No additional spray is needed on the outgoing side, at least on shortwall machines.

Well installed and not wasted, 1½ gal. of treated water will serve for a ton of cuttings, but 2½ gal. usually will be necessary. Tests show that ⅜x0-in. coal from cuttings gains about 1 percent of moisture. With water alone, the quantity of water used should be doubled.

Clean Coal to Win the War

Impact of War on Preparation Plants—Coal operators must not jeopardize their future in the industrial steam market by failing to maintain their quality standards during the war, declared W. D. Steele, preparation manager, Consolidation Coal Co., Fairmont, W. Va., at the coal-preparation session, April 28, at which J. S. Forman, vice president, Mt. Olive & Staunton Coal Co., St. Louis, Mo., was chairman. Of the three war industries markets, first place should be accorded to the metallurgical market, which will absorb between 10,000,000 and 15,000,000 more tons this year than ever before.

To produce and clean this additional quantity of quality coal, this market will have to be given a priority in quality and quantity, even if it results in sacrifice of other markets less essential to the war production program. To meet this big demand in an orderly and just manner will require full cooperation from both consumer and producer. No longer should tracks at the mines be obstructed with "no-bill" cars containing coal of quality and size that the particular market sought cannot use. Such mistakes can be avoided by making a careful advance study of the correct place in which to dispose of the fuel.

At this time, when screen changes may result in a loss of tonnage, it has become particularly desirable to study the plant facilities and market demands and reduce the number of sizes made. As an instance of the variation in the latter direction where uniformity would be desirable, the designated top sizes of stoker coal and dedusted screenings may be in practice 1 in., 1¼ in., or even 1½ in.

In District No. 8, interjected O. O. Malleis, technical director, Coal Board No. 8, there is a trend toward making 1-in. the top size for stoker coal instead of 1¼-in., which hitherto has predominated.

Close Sizing Aids Drying—At the Piney Fork plant, a new Link-Belt installation, 1¼-in. washed coal, after it has been split into three sizes, is dried most successfully, said James Hyslop, general manager, Hanna Coal Co., St. Clairsville, Ohio. This process he illustrated with projection slides. The 25-percent surface moisture in the 0x1½-mm. coal which cannot readily be reduced by thermal drying is lowered to 6 percent surface moisture in a 48-in. C. M. & I. continuous centrifugal dryer. The moisture in the 1¼-in. washed coal is dried in two sizes (1½-

Coming Meetings

- Rocky Mountain Coal Mining Institute: annual meeting, June 10, 11 and 12, Hotel Utah, Salt Lake City, Utah.
- American Society for Testing Materials: 45th annual meeting, June 22-26, Chalfonte-Haddon Hall, Atlantic City, N. J.
- American Retail Coal Association: annual meeting, June 24, Morrison Hotel, Chicago.
- Society for Promotion of Engineering Education: meets June 27-29 at Columbia University, New York City.

Via Barber-Greenes
... at Truax-Traer
Elkville, Illinois
HERE'S another Barber-Greene system, not just cutting coal handling costs, but simplifying the entire operation. The economy, simplicity and unique flexibility of Barber-Greenes have been proven so conclusively that the conveyor system is being extended 1,200 feet underground. (See standardized sections ready for installation, lower left corner.)
Without obligation, you can have the benefit of Barber-Greene's vast experience. With surprisingly little investment, you can have the many outstanding time and money saving advantages that can only be found in Barber-Greenes.
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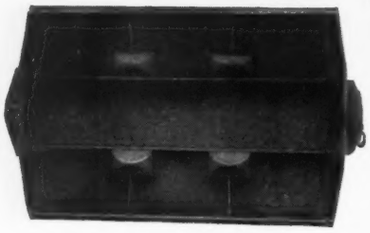
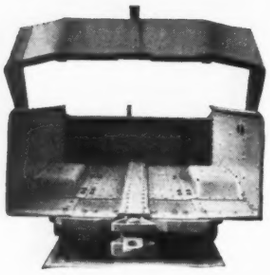
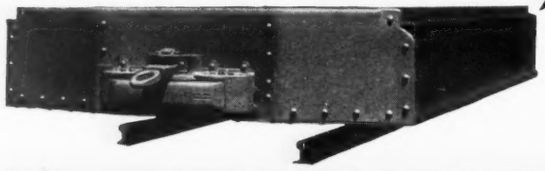


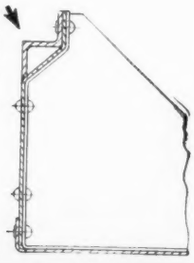
Ruggedly built for *three shift* production, P.S.C. All-Steel Mine Cars are moving maximum loads every hour around-the-clock. Special types developed for underground and open pit mining provide uninterrupted heavy duty service with minimum maintenance.

Let our engineers make a recommendation on the type best suited for your requirements. Bulletin 66 sent on request.



Note the exclusive design feature of this Low Height Rotary Dump Car—Combination flanged side sheet and heavy "Z" bar, provide rugged top chord construction, with shelf for holding car in dump. Top leg of "Z" bar is riveted and bottom leg is welded to side plate.





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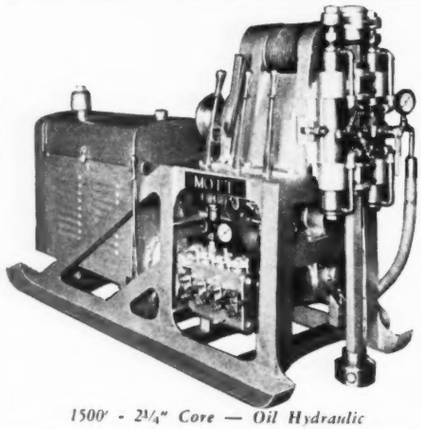
(INDUSTRIAL DIVISION)
PITTSBURGH, PA.



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MOTT CORE DRILLING CO.
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Lewis Ousts Murray From Post as U.M.W. Official

Abandoning the basis of charges which were being prepared against Philip Murray, Congress of Industrial Organizations head and vice president of United Mine Workers, John L. Lewis, miners' president, summarily removed him from the latter post on other grounds on May 28 at a meeting of the policy committee in Washington. The action was sustained by the international executive board.

On leaving a policy committee meeting the preceding day, Mr. Murray had said he would return, assuming that he would be cited for trial before the international union executive board for opposing Mr. Lewis' labor unity move, for failing to act against detractors of Mr. Lewis in the C.I.O. and for holding that an item of $1,665,000 advanced by the U.M.W. to the C.I.O. was a gift and not a loan.

A spokesman for the miners' union explained that Mr. Lewis' action was taken on constitutional grounds, which permit him to remove an official for "just and sufficient cause."

---

mm. x ⅜-in. and ⅜-in. x 1¼ in.) by two screen-type thermal dryers made by the Link-Belt Co.

Each has a 6x16-ft. screen deck over which the coal travels in 12 seconds. Reinforced-concrete windboxes convey air to the screens. Those for the larger coal unit are of stainless steel with $\frac{5}{16}$-in. round perforations. With the fine-coal unit, the Bixby-Zimmer cloth with its 1¼-mm. openings became blanketed, but, after much experimentation, satisfaction was obtained with a cloth made by the same firm but fitted with $\frac{1}{16}$-in. wires running lengthwise in the screen and spaced ½ mm. apart. The surface moisture of the fine coal can now be reduced from 12 to 1 percent. In the other dryer, which has a feed of ⅜x1¼-in., the surface moisture is reduced from 7 to 1½ percent.

Because washing jigs operate in closed circuit and the effluents from the centrifugal and heat dryers go back into the sludge tank, the fine coal slurry is recovered and marketed by mixing it with the slack after the former has been passed through the centrifugal dryer. When handling only underground coal, the fines do not build up, but if the plant feed is partly strip coal, as usually is the case, the system must be bled once a week to avoid a build-up.

Reference was made by C. J. Potter to a table in Michigan, an adaptation of the Wilfley type, which is cleaning a Chance cone effluent containing mostly minus ¼-mm. coal with some sand.

Shooting Coal by Blueprint—As a result of a long study of the three operations, cutting, drilling, and shooting, a standardized system of face preparation for mechanical loading has been devised and has been set forth by sketch and instruction to foremen, said F. Earle Snarr, assistant to the general superintendent, Chicago, Wilmington & Franklin Coal Co., Benton, Ill. This system, which is never varied from season to season or to meet market demands, has been used

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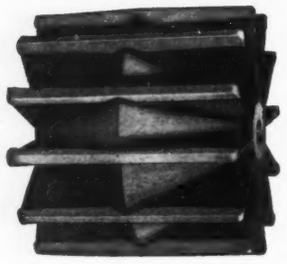

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for several years. Shooting coal by blueprint is the only way that uniform results can be obtained.

When the mines were mechanized, beginning about ten years ago, as much attention was paid to maintaining quality and high percentages above 2-in. as was given to the best way of loosening the coal for the loading machine, and the company never adopted the practice of laying the coal out on the floor so that the loading machine could the more easily gather it.

Drilling for Best Results — All coal is drilled with molefoot cutter heads and such twist augers as are still remaining are being replaced rapidly by a type consisting of a conveying helix welded onto a tube. This type of auger cleans the hole so well that there is little need to scrape the holes. The augers are in 3-ft. sections held together by square shanks secured by a ball and spring. Motor troubles with the post-mounted electric drills have been reduced materially by use of these new augers.

Stripping Enters New Paths

Discussions on power distribution, dragline methods, haulage, shovel-tooth maintenance and the coal-pinning machine were the "strictly strip" subjects of papers presented at two separate sessions devoted to that type of mining which were held on the afternoons of April 27 and 28, simultaneously with other sessions devoted principally to underground mining. A new subject, drift mining from strip pits, rounded out the strippers' program. The symposium fully justified the belief that strippers are numbered among the industry's most aggressive members.

Chairmen of the two sessions, K. R. Bixby, general manager, Midland Electric Coal Corporation, Farmington, Ill., and K. A. Spencer, vice president, Pittsburg & Midway Coal Mining Co., Pittsburg, Kan., were introduced in each case by W. L. Burt, vice president, the Jefferson Co., Wheeling, W. Va., the Ohio State chairman of the program committee.

Protection From Ground Faults—Use of an impedance in the ground connection at the substation transformer bank for ground-fault protection is considered invaluable at operations of the Enos Coal Mining Co., Oakland City, Ind., said Russell L. Alpine, chief electrician. Shovel operators and pitmen, when they come in contact with the shovel frame, are by this impedance protected from dangerous shocks. Circuit breakers with induction relay trips both at the substation and on portable sleds between pole line and trailing cables so isolate a fault that the rest of the system is not affected. By use of pellet-type arresters at junction of pole line and sled, combined with a special capacitor on the shovel, lightning damage and shutdowns are practically outmoded. By power-factor correction alone, General Electric pyranol capacitors at the tipple saved their cost in six months.

As explained by Mr. Alpine, an ungrounded system has the advantage that a fault in one phase wire need not interrupt service; however, the system does not afford opportunity to install equipment which will point to and isolate the fault. In contrast, the solidly grounded system will clear the circuit of a section having a ground fault but may raise the voltage of the equipment to a high value if the system is not thoroughly grounded. Advantages of both of the above systems are combined in the impedance grounded system, and the voltage above ground of a poorly grounded machine is limited to a value "not great enough to be dangerous to life, if the system is properly designed."

On the 2,300/4,000-volt Y-connected Enos system, the impedance is about 46 ohms; thus the ground fault current is limited to 50 amp. and the maximum drop from shovel frame to ground is about 100 volts, provided the line impedance is about 2 ohms. A current transformer in series with the ground connection and impedance operates an induction relay which trips the overload circuit breaker.

Rubber-jacketed trailing cables which have copper jackets over individual conductors are safer than cables that have only ground wires, in the opinion of F. B. Janeway, chief electrician, Sunlight Coal Co., Boonville, Ind., but the splicing of such cables is made thereby more difficult. In reply to Mr. Janeway, Mr. Alpine said: With the impedance ground system, faults in cables are located by short-circuiting the impedance and opening and closing circuit breakers, thus causing the break to flare up. Cable faults have been located in as short a time as 10 minutes. Relays at the substations are set to operate in 2 to 3 seconds; those in the sled cabinets are instantaneous.

Declaring that he had been asked to conserve copper by taking down and reclaiming the ground wires of lines at strip operations, Mr. Hyslop said he understod that, by an arrangement of special equipment, the safety advantages of the impedance ground system could be obtained even though the pole line has no ground wire.

Shovels Versus Draglines—Draglines, said Lafe Stewart, chief engineer, Maumee Collieries Co., Terre Haute, Ind., excel in flexibility and versatility by reason of their long reach and the depth to which they will dig, but they are somewhat less able to handle rock formations than a shovel of the same frame size and electrical equipment. Quick movement to meet drainage conditions and ability to place unstable spoil in flat slopes are favorable characteristics of the dragline.

Mr. Stewart showed colored movies of a 15-cu.yd. 215-ft. boom dragline working in tandem with a 23-cu.yd. shovel. With the graph, he illustrated the fact that when a dragline works alone in a pit having a high-wall slope of $\frac{3}{4}$ to 1 and a spoil slope of $1\frac{1}{4}$ to 1, it will require 1.83 ft. additional reach for each foot of depth added to the overburden.

By operating a dragline and shovel in tandem, overburden too deep for the shovel to handle alone can be removed or more spoil will be discharged. The dragline usually travels along the spoil bank opposite the shovel wherever the reason for adopting the tandem arrangement is the extreme depth

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1. Two bulbs (one for emergencies) — miner is never in the dark.
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8. Lead-acid type battery maintains high voltage throughout shift (80+% efficiency) — year after year.
9. Battery charged through headpiece and cord of cap lamp — a daily test of all connections.
10. Designed for self-service charging system for lowest lamphouse operating cost.
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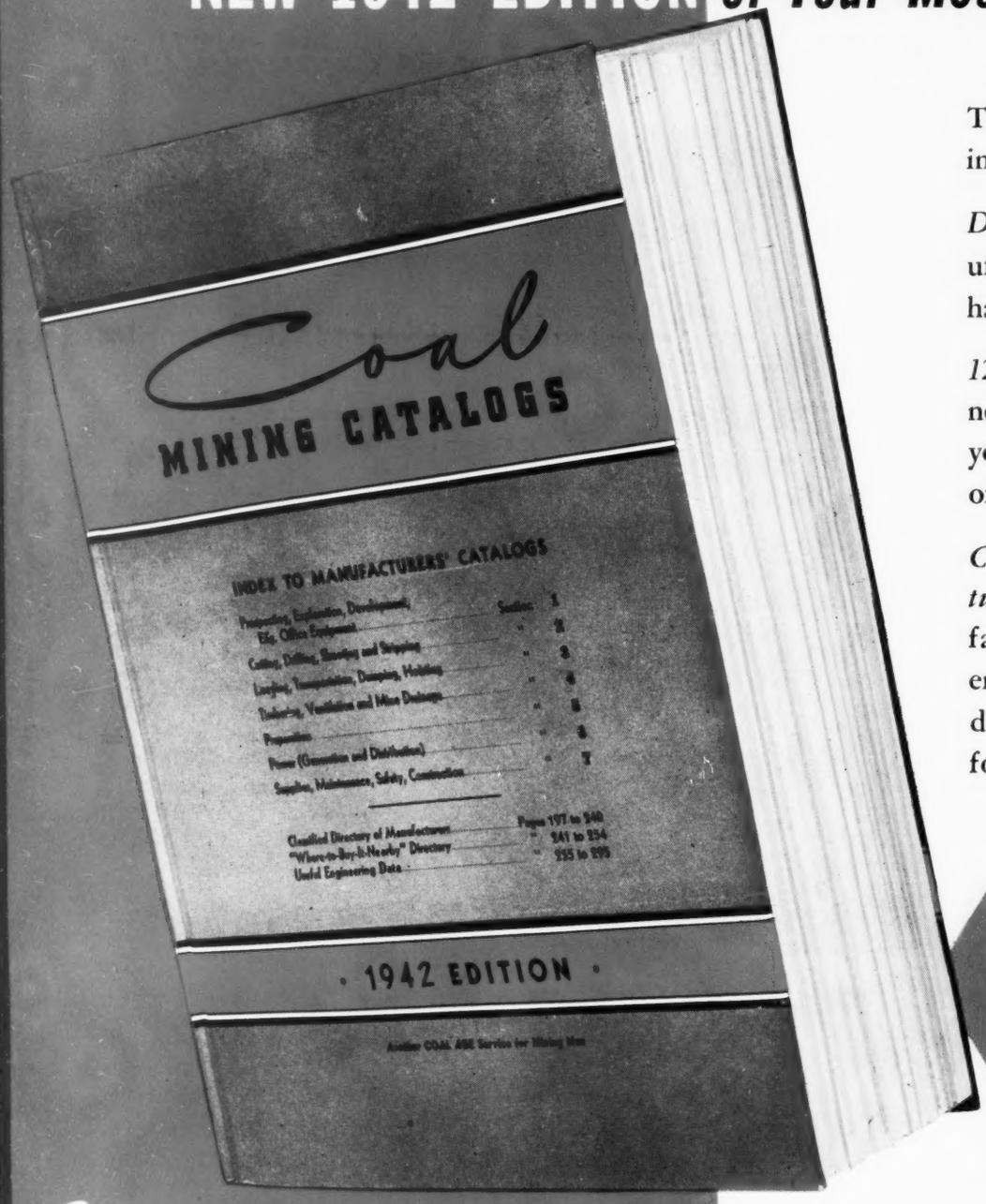

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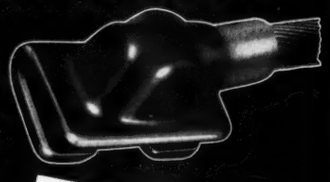

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Large welding area for permanent work. For temporary installation this bond can be welded on ends of lugs only, then easily removed and reused many times.

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of the overburden, but this, of course, is a system that involves rehandling the spoil. In another tandem method, the dragline is placed in the pit behind the shovel and digs from the high wall, dumping its spoil on the top of that which the shovel deposits. Here, a large part of the spoil is handled only once. It has a definite advantage where roads are maintained through spoil, but, with this method, close coordination is needed at the end of the cut when the dragline is obliged to pass the shovel.

A third method, but one not often used, is that in which the dragline is placed on the high wall ahead of the shovel and casts its spoil into the pit ahead of that unit. Disadvantages are that the top and softer portion of the overburden is deposited at the base of the spoil bank and the shovel must then reach to a great height when depositing its spoil.

Maumee's No. 23 mine uses a fourth method: the dragline, being on a high-wall bench back of the shovel, casts its spoil behind that of the shovel and over the main shovel cut. In this, only pay yardage is handled, but the dragline must have a very long reach. With a dragline of one-half the shovel capacity, the former must handle one-third the combined yardage. Shovel yardage increases when the work of the two is combined in this manner. Tandem operation enables depths of cover to be removed which the shovel alone would not be able to handle.

Does Not Favor Dragline

Dragline operation is much abused and should be avoided if at all possible, countered T. H. Latimer, United Electric Coal Cos., Chicago. His company had finally abandoned it. Although the dragline has a capacity only one-third that of a shovel, it costs just as much to operate. True, its use may reduce sliding, but, where the slides are small and infrequent, the extra cost of operation per cubic yard involved in the use of a dragline instead of a shovel is unwarranted.

Extension of Stripping Below Ground—Underground mining at Elkville, Ill., a strip operation of the Truax-Traer Coal Co. with loaders, shuttle cars and conveyors, began April 15, 1941, and by September, 1941, 2,000 tons daily from under heavy cover was being produced, according to J. M. McCoy, engineer. Equipment consists of rubber-tired arcwall Sullivan cutters, three Joy 11BU loaders, seven Lee-Norse 6-ton cable-type 4-wheel-steer-and-drive shuttle cars, Barber-Greene belt conveyors for two and a half cross entries, with a belt stacker and other elevating and horizontal belts of the same make sufficient to carry the coal from the drift mouth to a 25,000-ton stockpile on high undisturbed ground.

C. T. Heyden, vice president and general manager, Sahara Coal Co., who also has added underground operations to a strip pit, emphasized the better use thus made of capital investment, and A. F. Lee, engineer, Pyramid Coal Corporation, which operates a strip mine in the same general territory, said that the underground mining is a recent development and, in regard to the arcwall cutter, that cutting near the bottom under the blue band would "tear up any undercutter made."

Shovel-Tooth Maintenance — Instead of welding new stock onto a tooth, all worn

metal is replaced by welding at the strip pit of the Northern Illinois Coal Corporation, Wilmington, Ill., said O. E. May, chief engineer, in his paper on shovel-tooth design and maintenance. A thin layer of metal from a nickel rod is used first, and on this is laid metal from manganese rod. The nickel gives the manganese a better hold on the tooth. Finally the point is surfaced with tube borium.

On the 32-cu.yd. shovel, the sub-base is renewable and protects the lip from rapid wear. On this shovel, three lips have been used, each handling 16,000,000 cu.yd. before being discarded. On loading shovels, teeth which formerly were scrapped when dulled have been replaced with light-weight long taper teeth which have four directions of wear and also are resharpened by welding.

Stripper teeth dig 200,000 times per month and penetrate 100 to 180 miles of bank in that time, according to Mr. May. Teeth should be taper-fitted to the bucket to prevent the improper functioning and excessive wear that follows their loosening. Time to renew a tooth is when digging efficiency is impaired, at which point the reconditioning cost per yard will be at a minimum. Sharp teeth should have relief angles of 4 to 6 percent. Strength admittedly is a fundamental of tooth design, but the teeth nevertheless should be the weakest links between materials and machine.

Dentistry Before Breakage

Mr. May used projection slides to illustrate tooth designs, proper wear, excessive wear and methods of build-up. A new tooth for the big shovel weighs 72 lb. and, when about 8 lb. has been worn off, the tooth should be removed for repairs. Teeth will give longer service than that without breakage; in fact, one tooth, which had experienced excessive wear and for that reason had to be scrapped, weighed only 56 lb. The best tooth is not always the one that operates at least combined purchase and maintenance cost but the one that gives the lowest digging cost per cubic yard. At the Wilmington mine, where water, sand, sandy shale and sandstone promote excessive wear, the shovel runner and pit foreman decide when teeth should be renewed.

In discussion, R. M. Leseney, Truax-Traer Coal Co., said that when teeth are not turned over but are allowed to wear on one side only they are welded at less cost and give more service per renewal. Tooth breakage is reduced by keeping sub-bases built up so as to insure a proper fit. Drop-forged teeth are used, and after the worn ones are built up they are tipped with Stoody self-hardening material.

Hauler Data—Hauling equipment at strip mines in the eastern Ohio field has an average power of 10.9 hp. per ton of clean coal hauled, a higher figure than in the fields farther west, said A. D. Henry, in a paper titled "Strip Mine Haulage in Eastern Ohio." Gradients are steep and a large part of the hauling is done on public roads. The haulers of the 5- to 10-ton class, as used by such smaller operators, as can strip coal under 40 ft. of cover or less, are trucks with backdump bodies and have motors of 85 to 100 hp. In the next class, the 10- to 20-ton backdump trucks and semi-trailers, fall the 10- and 15-ton trucks of the Hanna Coal Co. and the 16-ton semi-trailers of the Haverhill

THE SAFETY CLIP **FIST-GRIPS** WIRE ROPE

The finger-pinch of the U-Bolt on wire rope bites and crushes the strands — breakage is possible when the bowed rope takes tension and whipping.

Use the *Fist-Grip* Safety Clip, that holds rope straight and round. Its four flat bearing surfaces act like a *fist* of drop-forged steel.

Inexperienced or rushed workers can't put it on backward — both halves are identical — no possibility of dangerous mistake.

95% rope efficiency is delivered by test — far greater than the U-Bolt Clip.

Safety Clips Give Steel for Victory Program

25% less steel goes into the set of Safety Clips that will out-hold a U-Bolt assembly. And that steel goes straight into guns and tanks and ships when you buy Safety Clips.

More than this, beside needing fewer clips, there is no waste of precious rope from cutting off U-Bolt-crushed ends.

SPEED AND SAFETY WITH SAFETY CLIPS

No rope bowing or crimping
ROPE SAVED

No battered, bent threads
CLIPS SAVED

No special wrench
TOOLS SAVED

Bolts on opposite sides
TIGHTENING TIME SAVED

Can't go on wrong
ACCIDENTS SAVED

Fewer clips needed
CLIPS SAVED

Fewer rope breaks
ACCIDENTS SAVED

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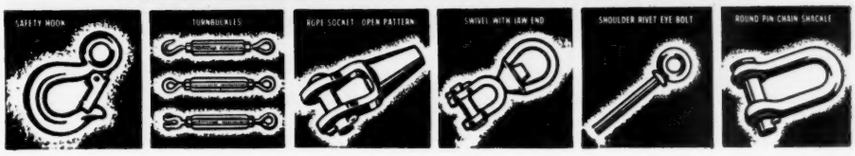

Coal Co. The Hanna company operates six 10-ton units with 116-hp. motors and five 15-ton units with 230-hp. motors.

Six 198-hp. 4-wheel-drive tractors with 25-ton drop-bottom trailers used by the Jefferson Co. represent a third class and the largest class in the district. The hauler most recently purchased has coil springs which reduce side sway, decrease its frequency and also cost of repairs and shorten the period during which the truck is out of service for that reason. Road gradients are held to 6 percent and the roads are built of "one-man rock" surfaced with a layer of gob 18 to 24 in. thick.

Discussion developed that the 70-ton haulers (sometimes loaded to 80 tons) used at Tiger mine are doing an economical job and that experience shows them to be "the bigger, the better." Butane is a very economical fuel and reduces motor maintenance, said Mr. Spencer. Trucks with 250-hp. butane engines governed so as not to exceed 40 m.p.h. and hauling 7 miles are handling 750 to 800 tons each per shift.

Split Coal With Big Steel Pins—Reduced cost and safer operation have been achieved by a pinning machine which was described and illustrated with slides, by C. M. Guthrie, superintendent, Seneca Coal & Coke Co., Broken Arrow, Okla. (*Coal Age*, May, 1941, p. 43).

Indicative of the safer operation, the accident insurance company has reduced the pit rates and is urging the mining company to introduce pinning at its other mines. The machine has been tried in a 28- to 30-in. seam and gives satisfaction in coal of that thickness. Cost of the unit was about $7,500 including the tractor and the parts that were built in the mine shop.

In comment, Mr. Spencer said that his company had made a similar machine and at one mine had saved thereby $7,800 per month. Niggerheads present some difficulty, at times bending and breaking the pins.

At the No. 18 mine, said J. A. Miner, engineer, Pittsburg & Midway Coal Mining Co., 1,500 to 2,000 tons per 7-hour shift is loosened by pinning from an 18-in. seam, and that the practice has prevented the formation of lumps of excessive size. The coal has been pinned for as great a distance as 2,000 ft. ahead of the loader without hindering the driving of trucks on top of the coal.

•

Knox Consol Sinks Shaft

Knox Consolidated Coal Corporation, Bicknell, Ind., is sinking the shaft for Mine No. 5, just south of Bruceville. Material to be removed from abandoned No. 4 is to be used to arrange for hoisting coal at the airshaft for the duration. This development is to assure maintenance of present production levels.

•

Up- and Downcast Airshaft Ready

Dresser mine of Walter Bledsoe & Co., Terre Haute, Ind., has completed a combined up- and downcast airshaft 11,000 ft. from the hoisting shaft. By 1943 the underground operations will be confined to that area. A new Jeffrey Aerodyne fan has been installed and a pushbutton-operated manhoist will be added. An underground machine shop will be located conveniently nearby.

Kentucky Wins First Move In Differential Fight

Western Kentucky coal producers seem to have won the first skirmish in their fight against preferential railroad freights given southern Illinois and southern Indiana operators on shipments to Chicago and the Northwest. In a report to the Interstate Commerce Commission one of its examiners, Burton Fuller, upheld the contention of the Kentucky Railroad Commission and Kentucky mine operators that the present rates are unduly preferential to the Illinois and Indiana fields.

The rate from western Kentucky to Chicago and Northwestern points is 35c. higher than from the Illinois and Indiana mines. The examiner's report recommends that the differential should be no greater than 25c.

•

Delivery Date Must Be On Priority Requests

All applications for priority assistance which do not specify a required delivery date will hereafter be returned to the applicant by the War Production Board, according to an announcement on April 23 by J. S. Knowlson, Director of Industry Operations. Priorities Regulation No. 1 as amended requires every applicant for priority assistance to specify in his application the latest date on which the items in connection with which priority assistance is requested can be delivered to him to meet his contract obligations or production schedules.

Nevertheless, many applicants, especially those submitting individual applications on PD-1A forms (used by machinery and supply manufacturers), have been specifying "immediately" or "at once" instead of filling in a definite delivery date. Hereafter, no such applications will be considered until an exact delivery date has been filled in.

•

Utah Fuel to Expand Output For Pig Iron Plant

The Sunnyside property of the Utah Fuel Co., in Carbon County, Utah, is to furnish coking coal for a new pig-iron plant to be built for the Kaiser Co., Inc., at Fontana, near San Bernardino, Calif., according to a statement by Moroni Heiner, president of the coal company. According to Mr. Heiner, the two companies are to spend more than $1,000,000 for mining machinery and equipment, a new coal-preparation plant, and rehabilitation and enlargement of the Sunnyside plant. The California plant is to have a capacity of 1,200 tons of pig iron a day, and it is estimated that more than 2,500 tons of coking coal per day five days a week will be required. The coal will be coked in by-product ovens now under construction at the Kaiser plant.

Deliveries of the coal to the California plant are expected to begin late in the autumn. In addition to the coking coal to be produced for the Kaiser company, Utah Fuel is planning to increase its regular commercial production at Sunnyside from 400 tons per day to more than 1,000 tons. Much of this coal will be coked in 300 beehive ovens that are now being renovated from among 819 ovens available at Sunnyside.

Sunnyside has been almost a ghost town for a long time, although once a mining village of some importance. Its coking-coal mines were opened in 1900, and in 1918, its peak year, 845,532 tons of coal was produced. Coke output that year was about 420,000 tons.

•

Ruling on Coal Imports Eased by Canada

Canadian importers of coal and coke shipped from the United States have found it difficult sometimes to have in their possession at the time of entry customs invoices properly certified as to origin. Therefore the Canadian Department of National Revenue has ruled that when these products are imported by rail direct from the point of production or by water from Great Lakes ports it may be assumed that they are the product of the United States and, until otherwise advised, invoices may be accepted for entry under the intermediate tariff, even if not bearing the prescribed certificate of origin.

•

Service Charges Must Be Reported Monthly

Producers and distributors of Pennsylvania anthracite who make any charges for special services must report the charges to the Office of Price Administration monthly, Administrator Leon Henderson announced May 13. Producers' ceilings on anthracite were established by OPA on April 1.

The report to OPA must show the nature of the special service, the charge per net ton, and the aggregate tonnage sold subject to the special charge, it is provided by Amendment No. 4 to Maximum Price Regulation 112. The amendment became effective on May 16. In a second provision of the amendment, OPA refused to exempt the Franklin-Lykens Coal Co., Ashland, Pa., from the rice regulation but granted the company a premium of from 30c. to $1.25 a ton on sizes larger than pea and 10c. per net ton on rice (buckwheat No. 2) marketed under the trade name "The Only Genuine Franklin Coal of Lykens Valley."

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Industrial Notes

Hercules Powder Co. has appointed William J. Austin, manager of the Chicago office of its explosives department, as director of purchases of the company. He succeeds Kurt W. Jappe, who will become manager of detonator operations. Frank W. Roman, assistant manager of the Chicago office of the explosives department, will replace Mr. Austin as manager of that office.

LaPlante-Choate Mfg. Co., Inc., Cedar Rapids, Iowa, announces the appointment of A. D. Dennis as secretary-treasurer. For the last 6½ years he has been an Internal Revenue Agent. Previous to that he was with the Bank of America in San Francisco, Calif.

Copperweld Steel Co., Warren, Ohio, has appointed N. H. Brodell as metallurgical sales engineer. A graduate of Carnegie Institute of Technology, he was previously

connected with the Timken Steel & Tube Division, Crucible Steel Corporation and the United Alloy Corporation. Howard W. Broecker has been appointed assistant district manager in the Chicago district. He was previously connected with the Youngstown Sheet & Tube Co. and with the Interstate Iron & Steel Co.

DELTA-STAR ELECTRIC CO., Chicago, has appointed Robert S. Keeler as manager of its New York office. A graduate of Purdue University, Mr. Keeler has had several years' experience in the utility field and since 1936 has been in Delta-Star's Chicago office on sales and engineering work.

WORTHINGTON PUMP & MACHINERY CORPORATION, Harrison, N. J., has elected Charles Neal Barney a vice president. A member of the Worthington organization since 1918, he has been treasurer since 1931 as well as head of the legal department.

WESTINGHOUSE ELECTRIC & MFG. CO., East Pittsburgh, Pa., announces election of four executives to the rank of vice president: Andrew H. Phelps, Pittsburgh, Pa., manager of purchases and traffic; L. E. Osborne, Philadelphia, Pa., manager of the steam division; Frank C. Reed, Jersey City, N. J., president of the Westinghouse Electric Elevator Co., a subsidiary, and Walter C. Evans, Baltimore, Md., general manager of radio, X-ray and broadcasting divisions. All will continue in their present executive posts. Mr. Phelps, who joined Westinghouse on Jan. 1, 1937, came from McGraw-Hill Publishing Co., where for seven years he served as sales manager and director of public relations.

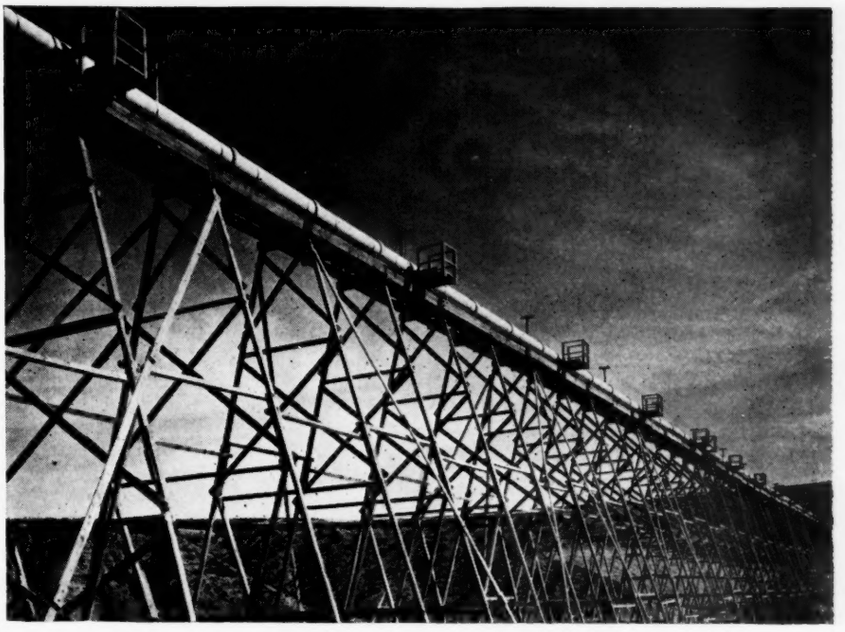
ALLIS-CHALMERS MFG. CO., Milwaukee, Wis., has elected Walter Geist president. He replaces W. C. Buchanan, whose resignation was forced by ill health several weeks ago. Mr. Geist entered the company's employ as an errand boy in 1909. William C. Johnson, sales manager of the crushing and cement division, has been named manager of the general sales organization. He will direct the sales of 1,600 different products and the operations of 60 district offices. He joined the organization in January, 1924.

METAL & THERMIT CORPORATION, New York City, has appointed Harold P. Blum as its Cleveland representative to handle sales and service of the Murex line of arc welding electrodes. He will continue to represent Una Welding, Inc., with which he has been connected for several years.

B. F. GOODRICH CO., Akron, Ohio, has appointed George Livermore as district manager at St. Louis. Mr. Livermore, for many years special company representative on products for the oil pipeline and oil distributing agencies in the Southwest, succeeds John S. Gulledge, who has resigned to enter the Army Air Corps.

WHEELCO INSTRUMENTS CO., Chicago, has appointed four new district representatives. Pasol Engineering Co. has been named Iowa and Nebraska representative, with V. E. Lindquist in charge of the Iowa office at Des Moines and I. I. Solzman heading the Nebraska office in Omaha. Fitzgerald, Inc., Wichita, has been assigned the Kansas territory. Charles A. Drum, Houston, has been named Texas district manager.

TECO Timber Construction *Cuts Cost of* MORENCI LAUNDERS TRESTLES



Savings in time, timber and hardware . . . advantages in design . . . win mining engineers to TECO System

As one Phelps Dodge engineer, explaining why the TECO System was used in part of the construction of the Morenci Reduction Works, said:

"In our opinion, timber connectors were more economical than plain, bolted connections because we were able to develop the necessary strength at the intersections of bracing members and posts without the use of scabs and without perforating the members excessively. The braces are simply tapped across the posts. There were considerable savings in bolts and washers but the chief advantage seemed to be in the savings due to the reduction of labor and of the sizes of some of the main members."

For complete data on TECO and typical designs for large and small structures . . . write us today.

Timber ENGINEERING COMPANY

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YEON BUILDING, PORTLAND, ORE.

TECO Ring Connectors spread the load on a timber joint over practically the entire cross-section of the wood.

Portable's
CAP LAMP...
Will End Gradual Light Loss in your Mine

Many cap lamps now in use decrease 50% in efficiency in four years. The resulting light failure is so gradual that in many cases it goes unnoticed. But efficiency suffers in those mines, too! For a drop in light volume is a sure cause for a drop in safety and efficiency.

Portable's Cap Lamp is guaranteed against light volume loss. The Portable Double Filament Bulb, the Portable Lead Acid Battery, the tamper-proof headpiece all make this possible.

Protect yourself against loss of light and the resultant accidents and production slow-ups. Investigate Portable's Cap Lamp today.

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72 FIRST AVENUE PITTSBURGH, PA.
Cool Caps and Hats Electric Cap Lamps Safety Lamps
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250 LBS.
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DANVILLE ILL.

RFC to Aid Coal Shipments All Rail to New England

At the request of the War Production Board and the Office of Price Administration, the Reconstruction Finance Corporation will make funds available to cover excess costs of transportation of bituminous coal to New York State and New England by all rail or by combination rail and water involving smaller vessels not operated by the War Shipping Administration, according to an announcement on May 16 by Jesse Jones, Secretary of Commerce. The purpose of the arrangement is to permit the uninterrupted delivery and sale of soft coal in the territory named at ceiling prices fixed by OPA.

To prevent possible bottlenecks in the flow of southern Appalachian coal to New England by the rail-barge route via New York Harbor, the Interstate Commerce Commission has granted authority to shippers to designate the pier in this harbor where the coal is to be loaded on barges, regardless of the intermediate railroad involved, according to an announcement by Howard A. Gray, Acting Director of the Office of Solid Fuels Coordination.

•

Coal-Mine Accident Fatality Rate Shows Downward Trend

Accidents at coal mines of the United States caused the deaths of 69 bituminous and 16 anthracite miners in March last, according to reports furnished the U. S. Bureau of Mines by State mine inspectors.

With a production of 47,400,000 net tons, the accident death rate among bituminous miners was 1.46 per million tons mined, compared with 1.94 in March, 1941.

The anthracite fatality rate from accidents in March last was 3.15, based on an output of 5,081,000 net tons, against 3.48 in the corresponding month of last year.

For the two industries combined, the accident fatality rate in March last was 1.62, compared with 2.07 in the third month of 1941.

Fatalities during March last, by causes and states, as well as comparable rates for the first three months of 1941 and 1942, are shown below.

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West Virginia Mine Explosion Takes 56 Lives

A terrific explosion at 2:30 p.m. May 12 in Christopher No. 3 mine of the Christopher Coal Co., Osage, W. Va., caused the death, it is believed, of 56 miners. Rescue workers reported on the evening of May 13 that 47 bodies had been recovered. Company officials said nine more were missing and were believed to be dead. At the time of the explosion, there were 123 men in the mine.

N. P. Rhinehart, chief of the State Department of Mines, is reported to have said that the cause of the blast was undetermined and that an investigation would be started after all the bodies had been found.

•

Ceiling Prices Close Mine

Glen Rogers mine of the Raleigh-Wyoming Mining Co. had to close down May 19 because it was impossible to operate under maximum prices promulgated by the Office of Price Administration, according to an announcement by the company. L. T. Putman, vice president and general manager, said about 1,000 men were employed.

UNITED STATES COAL-MINE FATALITIES IN MARCH, 1942, BY CAUSES AND STATES

State	Underground: Falls of Roof	Falls of Face	Haulage	Explosives	Electricity	Machinery	Other Causes	Total Underground	Shaft	Open-Cut	Surface	Grand Total
Alabama	2	..	1	..	1	..	1	5	..	..	..	5
Colorado	1	..	1	1	..	..	..	3	..	..	..	3
Illinois	1	1	..	1	..	..	..	3	..	4	..	7
Indiana	1	..	..	..	..	..	..	1	..	..	..	1
Iowa	1	..	..	1	..	..	..	2	..	..	..	2
Kentucky	9	..	2	..	..	..	2	13	..	..	..	13
Ohio	4	..	1	1	..	..	..	6	1	..	..	7
Pennsylvania (bituminous)	5	..	3	..	..	2	..	10	..	..	..	10
Tennessee	1	..	..	..	..	..	..	1	..	1	..	2
Virginia	2	..	..	..	..	..	..	2	..	..	..	2
West Virginia	13	..	2	..	..	..	..	15	..	..	1	16
Wyoming	..	..	1	..	..	..	..	1	..	..	..	1
Total bituminous	40	1	11	4	1	2	3	62	1	5	1	69
Pennsylvania (anthracite)	11	1	2	..	..	..	..	14	1	1	..	16
Grand total	51	2	13	4	1	2	3	76	2	6	1	85

DEATHS AND FATALITY RATES AT UNITED STATES COAL MINES, BY CAUSES OF ACCIDENTS*

January–March, 1941 and 1942

Cause	Bituminous: Number Killed		Bituminous: Killed per Million Tons		Anthracite: Number Killed		Anthracite: Killed per Million Tons		Total: Number Killed		Total: Killed per Million Tons	
	1941	1942	1941	1942	1941	1942	1941	1942	1941	1942	1941	1942
Underground:												
Falls of roof and coal	139	135	1.039	0.966	29	34	2.071	2.364	168	169	1.137	1.096
Haulage	52	48	.388	.344	8	7	.572	.487	60	55	.406	.357
Gas or dust explosions;												
Local	6	.....	.045	.....	2	1	.143	.069	8	1	.054	.006
Major	6	34	.045	.243	.....	.....	.....	.....	6	34	.041	.221
Explosives	8	6	.060	.043	3	2	.214	.139	11	8	.074	.052
Electricity	6	6	.045	.043	.....	2	.....	.139	6	8	.041	.052
Machinery	10	4	.075	.029	.....	.....	.....	.....	10	4	.068	.026
Shaft	.....	3	.....	.021	1	1	.071	.069	1	4	.008	.026
Miscellaneous	.....	5	.....	.036	2	.....	.143	.....	2	5	.013	.032
Stripping or opencut	12	8	.090	.057	1	1	.071	.069	13	9	.088	.058
Surface	10	8	.075	.057	5	3	.357	.209	15	11	.101	.072
Grand total	249	257	1.862	1.839	51	51	3.642	3.545	300	308	2.030	1.998

* All figures subject to revision.

Of Course, We Believe In Advertising

Citing the "how-to-do-it" helpfulness of the industrial press in war time, the McGraw-Hill Publishing Co., Inc., with its 23 technical publications, called attention in a full-page ad May 15 in six leading daily newspapers to the place of the industrial editor in the task of winning the war. The advertisement appeared in the New York *Times*, Chicago *Daily News*, Philadelphia *Bulletin*, Detroit *Free Press*, Cleveland *Plain Dealer* and Washington *Post*.

•

Maximum Price Approved For New Coal Stove

A proposed maximum price of $48.20 f.o.b. factory for a new coal-burning stove manufactured by the Knox Stove Co., Knoxville, Tenn., was approved in Order No. 1 to Revised Price Schedule No. 64 (Domestic Cooking and Heating Stoves), issued May 5 by Price Administrator Leon Henderson. As the stove went into production after the schedule went into effect on Jan. 5 prices for its sale had to be submitted to OPA for approval.

•

Peerless Blast Kills Five

Five miners were killed and two others were seriously injured in an explosion May 11 at the Peerless Coal Co. mine, Excelsior, Ark.

•

To Arbitrate Captive Strike

Pending arbitration, operations were resumed May 20 at Clyde Nos. 1 and 2 mines of the Republic Steel Corporation, in western Pennsylvania, which had been shut down a week by a strike of 1,500 miners. The point at issue was whether 45 shotfirers should be required to carry explosives into the mines under a wartime federal regulation. Heretofore, miners carried the explosives to the shotfirers. The men returned to work under persuasion of United Mine Workers district leaders.

•

U. S. Men Inspect 100 Mines

Acting under the Mine Inspection Act, federal inspectors have investigated operating conditions in more than 100 coal mines in 15 states during the last four months and offered suggestions for maximum output with minimum of injuries to workers, according to a statement on May 7 by Dr. R. R. Sayers, director, U. S. Bureau of Mines. He said, furthermore, that the federal inspectors generally have received wholehearted cooperation from the management of mines, from State mining departments and from miners' and miners' organizations.

•

Trade Literature

AUTOMOBILE TIRES—B. F. Goodrich Co., Akron, Ohio. Booklet offers suggestions to motorists on how to extend the life of tires. Written by John L. Collyer, B. F. Goodrich

Build your own mine cars on the

DUNCAN

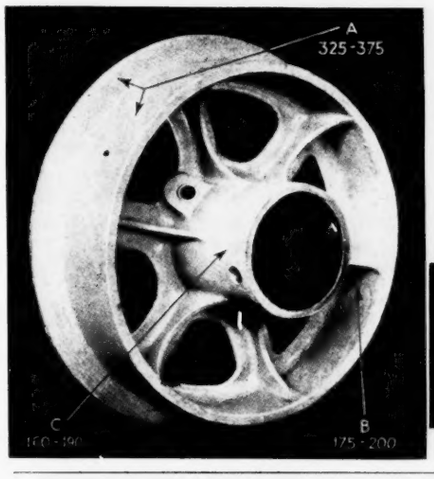
INTEGRAL-CAST STEEL AXLE

Due to the shortage of steel plate, Dr. Wilbur Nelson, head of the mining branch, WPB, urges the substitution of heavy wood reinforced with steel straps for mine-car construction. Duncan's new one-piece integral cast-steel axle enables the mine operator requiring additional equipment to construct his own cars at much lower cost—and eliminates vitally important mill shapes not now easily procurable.

THE DUNCAN CAST-STEEL AXLE ELIMINATES THE USE OF:

1 ROLLED AXLE
1 ROLLED CHANNEL
2 SHRUNK-ON DUST COLLARS AND
2 CAST-STEEL BOXES

Weighing 125 lbs., this one-piece axle replaces 225 lbs. of weight. Carefully controlled chemical properties and proper heat-treating makes this cast steel axle equal in strength to a rolled axle. It has been tested by bending to a 30° angle at each end under a force of 225 tons—without signs of fracture.



MINE CAR WHEELS and TRUCKS to any specification

Duncan is headquarters for all steel mine-car wheel and truck requirements: loose and tight wheels with ball, roller or sleeve bearings; continuous and roller-bearing trucks, etc. We'll be glad to help you solve your problems—let us know your requirements today!

DUNCAN FOUNDRY & MACHINE WORKS, Inc. ALTON, ILLINOIS

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president, the booklet, entitled "Will America Have to Jack Up Its 29,000,000 Automobiles?", proposes extensive rubber conservation should be put into effect in the armed forces; a centralized control for all rubber reserves; a national speed limit for the period of the emergency; limitation of the use of cars to necessary trips; strict regulation of the purchase of used and repaired tires, and careful use of tires and all other rubber goods.

BEARING SHAFTS AND HOUSINGS—New Departure, division General Motors Corporation, Bristol, Conn. First two of a new series of booklets to be distributed under the generic title of "New Departure Engineering Service," and now immediately available, give details of design of shafts and housings for ball bearings. Written for the benefit of the machine designer interested in applying ball bearings, these booklets include such subjects as proportions and finish of bearing seats; locknut threads, recommended shaft shoulders; designing to aid disassembly; locating and clamping methods and the use of adapter sleeves.

BELTING—B. F. Goodrich Co., Akron, Ohio. Catalog Section 2800 contains instructions for the care and maintenance of belting as well as chapters giving a wide range of belt data, valuable when considering installation or repair problems.

CARE OF RUBBER HOSE—Manhattan Rubber Mfg. Division, Raybestos-Manhattan, Inc., Passaic, N. J. Two wall cards on the proper care of hose prepared in the interest of rubber conservation. One card is devoted to care of fire hose, and the other lists rules for care of air, water, steam and other types of rubber hose and for proper attaching of couplings.

CENTRALIZED LUBRICATING SYSTEM—Trabon Engineering Corporation, Cleveland, Ohio. Bulletin 423 describes the Trabon single-pipe centralized system, which is said to lubricate all the connected bearings without employing any springs, diaphragms, packing or exposed moving parts.

COAL LOADERS—Myers-Whaley Co., Knoxville, Tenn. Folding military and naval map of World War II includes description of salient features of the "Whaley Automat" mechanical shovel.

COMPRESSED-AIR PIPE FRICTION—DeLaval Steam Turbine Co., Trenton, N. J. Chart makes it possible to determine quickly the drop in pressure accompanying the flow of air or gas through pipes of known diameter and length.

CONICAL MILLS—Hardinge Co., York, Pa. Bulletin 13-D describes Hardinge conical mills and their application in the field of grinding and pulverizing.

DRILLING EQUIPMENT—Ingersoll-Rand Co., Phillipsburg, N. J. Bulletin Form 2780 tells the advantages of detachable jackbits. Included are more than 50 illustrations and a table showing types recommended for different kinds of work.

DUST COLLECTOR—American Foundry Equipment Co., Mishakawa, Ind. Catalog 82 shows all of the mechanical features and specifications of the American high-efficiency cyclone dust collector and thoroughly explains construction and operating details. An engineering manual section gives practical essential data for efficient operation of a dust-control system, technical layouts and engineering tables and charts especially useful in planning applications of dust-control units.

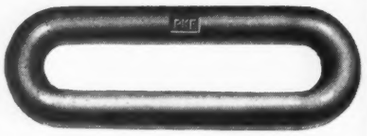
ELECTRICAL EQUIPMENT—Ohmite Mfg. Co., Chicago. Catalog 18 lists over a thousand stock items in rheostats, resistors, tap switches, chokes and attenuators. It gives illustrations, descriptions, ratings and other helpful information on the wide range of Ohmite stock types and sizes.

ELECTRICAL EQUIPMENT—Owens-Corning Fiberglas Corporation, Toledo, Ohio. Booklet entitled "What Keeps the Wheels Turning" is devoted to the prevention of production tie-ups caused by motor, generator and transformer breakdowns due to insulation failures. Booklet H9.2.1 covers "Fiberglas Electrical Insulation." H9.3.1 is on "Fiberglas Insulations for Electrical Equipment." H9.4.1 tells about "Fiberglas Insulations for Wires and Cables."

ELECTRICAL EQUIPMENT—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Catalog 30-000 simplifies selection of many types of electrical equipment. General subjects covered include: safety switches, no-fuze breakers, multi-breakers, panelboards, motor control and motors. New application data, on latest equipment in each of these groups, has been included. Electrical ratings, physical dimensions and circuit diagrams expedite selection of correct equipment for each purpose.

ELECTRICIANS' GLOVES—B. F. Goodrich Co.,

FOR SAFETY'S SAKE, SUPERIOR COUPLINGS



Drop Forged Links

Drop forged for strength, Superior Swivel and Single Link Couplings are built to stand the gaff. No welds to let go with resulting wrecks. Superior Couplings on your mine cars will prevent accidents and reduce haulage costs. Order Superior Couplings for your replacements and specify them on new equipment.

DROP FORGED SWIVEL COUPLINGS

PITTSBURGH KNIFE & FORGE CO.

716 Chateau Street

N. S., Pittsburgh, Pa.

QUALITY MARLO PACKING

METALLIC & SEMI-METALLIC

PACKING

for

MINE PUMPS

"The Packing that gets the Repeat Orders"

For deep mine pumps. Resists acid mine waters. Keeps grit out of stuffing box. Three types.

• MARLO ALL PURPOSE METALLIC PACKING

Best ever devised. Will not freeze at 70° below. Soft, pliant, like fibrous types, yet easier to handle. Won't cut, score or corrode moving parts.

• "TWIN-TWIST" SEMI-METALLIC PACKING

Metal strands twisted with asbestos. Anti-frictional. Durable. Economical. Remarkable compressability. Never hardens. For temperature up to 550° F.

• "RED WATER" SEMI-METALLIC PACKING

Most modern development for all hydraulic applications. A solid-packing vegetable fibre combined with metal strands. Retains form under any conditions.

Let us serve you!

THE MARLO COMPANY

38 HOWARD ST.

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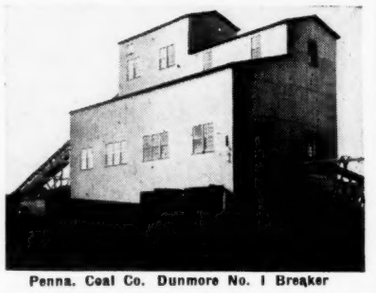


Penna. Coal Co. Dunmore No. 1 Breaker

WILMOT builds better breakers and equips them with the most efficient coal cleaning units.

★ ONE OF THE REASONS WHY

Anthracite is "Prepared"

TO MEET ALL WAR-TIME DEMANDS

★

Wilmot Engineering Co., Hazleton, Penna.

WILMOT

A GREAT NAME IN THE COAL INDUSTRY

HYDROTATOR COAL Preparation UNITS

for MORE Tonnage and LESS Time-Out

USE ROCKBESTOS A.V.C. MINING CABLE

In Your Cutters, Loaders and Locomotives...

There's no two ways about it, an all-time record-breaking pile of coal will have to be hauled out of the mines during the coming months. And this means that you can't have cutters, loaders and locomotives loafing around the repair shops – waiting for rewiring jobs.

Your best bet is to use Rockbestos A.V.C. Mining Cable for internal wiring and keep a jump ahead of cable failures that tie up equipment and rip production schedules to ribbons. It's a cable with *permanent insulation*. It won't dry out, crack, rot, bloom or burn. It's built for long, hard service. And it stands up under copper-heating overloads, oil, grease and moisture.

Order from the jobbers listed below. For sizes and diameters refer to McGraw-Hill Coal Mining Catalogs or write Rockbestos Products Corporation, P. O. Box 1102, New Haven, Conn., for Bulletin No. 30-C.

In the opinion of the Mining Branch of the War Production Board and expert observers in other Washington departments, the coal industry must be producing at the rate of 660,000,000 tons per year by the fall of 1942 to keep pace with present indicated demands. This estimate is at the rate of 600,000,000 tons for bituminous and 60,000,000 tons of anthracite coal per year.

by WILBUR A. NELSON
Administrator of Mining Branch, WPB.
April, 1942 — COAL AGE

The Original "A. V. C." Construction

1. The flexible tinned copper conductor is perfectly and permanently centered in helically applied insulation.
2. Paper separator prevents insulation from sticking to the conductor, makes stripping easy.
3. Heatproof felted asbestos is unaffected by conductor-heating overloads and doesn't burn even when exposed to copper-melting arcs.
4. Varnished cambric for high dielectric strength and added moisture resistance, protected from heat, flame and oxidization by two felted asbestos walls.
5. The outer felted asbestos wall serves as a heat-barrier against high ambient temperatures.
6. Heatproof, fireproof asbestos braid, resistant to moisture, oil, grease and alkalies, is diametered to properly fit bushings.

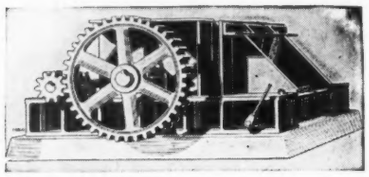
ORDER FROM THESE JOBBERS — SPECIFY "ROCKBESTOS A. V. C."

BECKLEY, W. VA.:	Beckley Mach. & Elec. Co.	EVANSVILLE, IND.:	Evansville Elec. & Mfg. Co.	MIDDLESBORO, KY.:	Rogan & Rogan Co.
BIRMINGHAM, ALA.:	Moore-Handley Hdwe. Co.	FAIRMONT, W. VA.:	Fairmont Supply Co.	PITTSBURGH, PA.:	Upson-Walton Co. Westinghouse Elec. Supply Co.
BLUEFIELD, W. VA.:	Superior-Sterling Co.	HUNTINGTON, W. VA.:	Banks-Miller Supply Co.	SCRANTON, PA.:	Penn. Elec. Engineering Co.
CLEVELAND, OHIO:	Upson-Walton Co.	LOTHAIR, KY.:	Mine Service Co.	WILLIAMSON, W.VA.:	Williamson Supply Co.

ROCKBESTOS A.V.C.

The Cable with Permanent Insulation

A NEW VERSION OF AN OLD TYPE



"PENNSYLVANIA" TYPE "K" SINGLE ROLL COAL CRUSHER

With this advanced design, in rugged STEELBUILT construction, far more accurate sizing is possible to meet Code requirements through quick adjustability, in a range from ¾" to 8".

Further—real protection is provided by improved Safety Toggle Equipment, which quickly passes Tramp Iron, and instantly returns Breakerplate to crushing position.

Seven (7) sizes afford a capacity range from 50 to 1000 tons per hour.

Send for Bulletin No. 2006.

Also,— **"PENNSYLVANIA" BRADFORD BREAKERS, BRADMILLS, GRANULATORS, HAMMERMILLS**

PUT YOUR COAL PREPARATION PROBLEMS UP TO US.

PENNSYLVANIA CRUSHER COMPANY

Liberty Trust Bldg. Philadelphia

Representatives in Principal Centers.

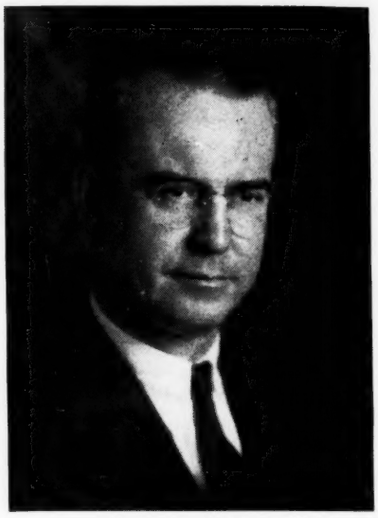
Akron, Ohio. Catalog section on electricians' gloves made by the Anode process from liquid latex, describes the manufacturing process and its advantages, illustrates the types of gloves the company makes, and the rigid tests which have to be passed before the gloves are certified for use.

INDUSTRIAL RUBBER PRODUCTS—B. F. Goodrich Co., Akron, Ohio. Pamphlet No. 5, on rubber hose, and No. 6, on mats and matting, are the last of a series of six on "How to Get the Most Service Out of Industrial Rubber Products." They give in simple language methods for conserving the precious material now restricted because of the war.

LOW-VOLTAGE AIR CIRCUIT BREAKER—Roller-Smith Co., Bethlehem, Pa. Catalog 2150 covers low-voltage air circuit breakers designed for use on a.c. circuits up to 600 volts and d.c. circuits of 250 or 750 volts. It lists closing and tripping currents, shows typical methods of making connections to large breakers, gives dimensions of both manual and electrical designs, and indicates the number and size of terminals for various capacity breakers.

LUBRICATION—Texas Co., New York City. To assist the coal mining industry in its war production efforts the Texas Co. has prepared maintenance lubrication charts covering coal cutters, loaders, locomotives, etc. These charts show where, when and with what lubricant to service each lubrication point in each type of equipment.

METALLIZING — Metallizing Engineering Co., Inc., Long Island City, N. Y. Bulletin 42A describes the metallizing process and equipment for its application. Tells briefly how to eliminate replacements and increase service life of equipment now difficult to replace, by building up worn diameters with any desired wear- and corrosion-resistant sprayed metal. Also indicates how metallizing is used to salvage rapidly mismachined parts and defective castings in production.



Lane W. Hildreth

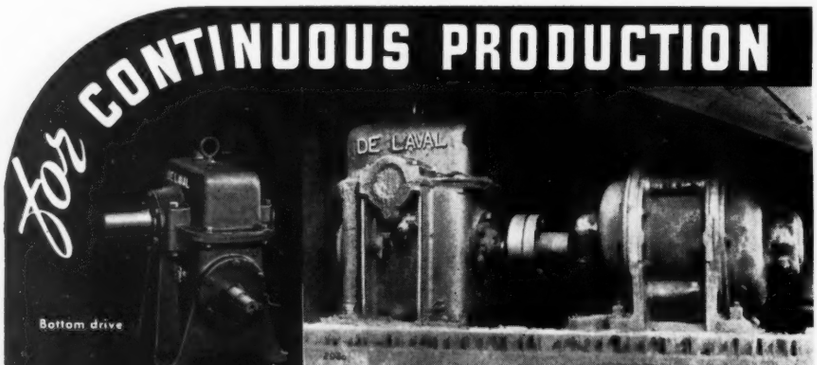
Made Chief of the Mining Machinery Section of the War Production Board on June 1, Mr. Hildreth joined its staff on Jan. 2. Graduated from the University of Wisconsin in mechanical engineering in 1924, he was engineer for 3½ years for Manufactured Gas Utilities. In 1929 he joined the staff of the Anthracite Institute, spending 10 years with that organization and occupying the position of secretary before severing that connection. Next he was engaged as sales engineer with the Cranberry Improvement Co. and the North American Coal Corporation, after which he became associated with the WPA.

OIL-CIRCUIT BREAKERS—Roller-Smith Co., Bethlehem, Pa. Catalog 3130 describes and illustrates small oil circuit breakers designed for use on alternating-current circuits in industrial plants where interrupting capacities of 50,000 kva. are required. Characteristics of each size of breaker are given as well as dimensions and typical control diagrams.

SAFETY EQUIPMENT—Mine Safety Appliances Co., Pittsburgh, Pa. Bulletin G-5 describes emergency safety equipment for plant protection and public safety departments. Covering the complete range of safety equipment needed during war-time conditions, the bulletin features, on the cover, a suggested grouping of essential items at strategic locations in plants. Inside pages carry descriptions of gas masks, helmets, gas detectors, inhalators, asbestos suits, goggles, respirators, first-aid kits, Foille for burns, stretchers, splints and fire blankets.

TOOL STEEL—Jessop Steel Co., Washington, Pa. Bulletin 142 describes Washington carbon tool steel, showing tempers and applications.

for CONTINUOUS PRODUCTION



Breakdowns in power transmission in 24-hour plants are eliminated where plant engineers specify the

DE LAVAL WORM GEAR

for heavy duty drives, particularly in locations involving exposure to grit, dust and moisture.

The two moving parts of the gear run in a bath of oil and it is self-lubricating, requiring no attention beyond inspection of the level in the oil well at long intervals.

The unit does not throw grease or oil.

Safety guards are unnecessary, as the working parts are enclosed.

The efficiency is high, and improves with use.

The drive is smooth and quiet. It is also positive; there is no slippage, regardless of starting torque.

Describe conditions. Ask for Publication W-1132.

DE LAVAL WORM GEAR DIVISION of the De Laval Steam Turbine Co., Trenton, N. J.

EQUIPMENT TIPS FROM MANUFACTURERS

For War Production and Maintenance Problems

As submitted to COAL AGE editors from manufacturers whose products and services are playing an important part in the coal industry's vital war coal-production program and many of which were scheduled for exhibits at the Cincinnati Convention prior to cancellation of this exposition at the request of WPB.

POWER AND HAULAGE EQUIPMENT

General Electric Co., Schenectady, N. Y., has introduced two new Tri-Clad motors having application in the coal industry, a vertical general-purpose polyphase motor and a vertical shielded polyphase motor; the latter are suited for pumping applications, and the former for agitators, mixers, etc. Also available is a new high-interrupting capacity starter for 2200-volt 3-phase 60-cycle a.c. motors.

To meet the needs of mining service high-efficiency conversion equipment G.E. offers a complete line of mercury-arc rectifier equipments.

Sealed-equipped mine locomotive

The G.E. 40-ton haulage locomotive—two 20-ton units in tandem—is said to embody unusual features, exemplifying how units can be tailored to fit any application. In addition to dynamic brakes it has straight air brakes with emergency safety feature in case the units become separated. An 8-ton "sealed-equipped" locomotive which can be operated in gassy mines is a popular gathering unit.

•

SHOVEL-DRAGLINE-CRANE

Speed and low-cost operation are claimed for the Type 1201 3½-yd. convertible shovel, dragline and crane manufactured by the Lima Locomotive Works, Inc., Lima, Ohio. When used as a shovel the Type 1201 standard shovel is equipped with a 3½-yd. dipper, 32½-ft. boom and 22-ft. dipper handle. When greater working range is desired, a 42-ft. boom, 32-ft. dipper handle and 2½-yd. dipper can be furnished.

The shovel boom is of box-type design, electrically welded throughout. The dipper handle is of the same modern construction. The Type 1201 is available with either a diesel, oil or electric power unit. Only three levers and two foot pedals are necessary to control the three major operations: hoist, swing and crowd.

•

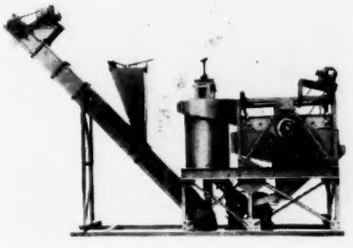
DISCONNECT SWITCH

Delta-Star Electric Co., Chicago, offers a new 3,000-amp. 23-kv. hook-stick-operated disconnecting switch with high-pressure silver-to-copper contacts at both ends. The design embodies a straight-line current path with current-carrying parts of hard drawn copper, thus eliminating castings. Rugged locks and a pressure-releasing device are standard equipment. These Type B2-P switches are available in capacities from 2,000 to 6,000 amp. and up to 34.5-kv. ratings.

•

COAL CLEANER

Roberts & Schaefer Co., Chicago, calls attention to the fact that the Hydrotator, which is widely used in the anthracite field, recently has been introduced into the bituminous field for the treatment of fine coal. The unit illustrated, says the manufacturer, is only one part of an efficient system of cleaning fine coal and for the recovery of sludge from washed water.



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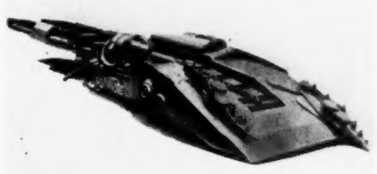
EMERGENCY KIT

Mine Safety Appliances Co., Pittsburgh, Pa., offers the Foille emergency spray kit which utilizes Foille, a new scientific preparation for treatment of burns, with an efficient spray gun so designed that a constant spray is forced through the atomizer tip, completely covering the burned area. Foille is said to provide quick relief of pain, characteristic absence of infection, and aid in faster healing. An ample supply of Foille—in jars which connect to the spray gun—is ready for immediate use when needed, without time wasted in mixing ingredients or making solutions. The all-weather steel case also contains a supply of burn dressings and first-aid materials.

•

COAL LOADERS

Joy Mfg. Co., Franklin, Pa., announces these improvements in its mechanical loading equipment: A new style low-vein shuttle car of 3½ tons capacity, 32 in. high, with side boards 39 in. high, capacity 4½ tons, has open space and new control for the operator's platform; new 6-ton four-wheel-drive



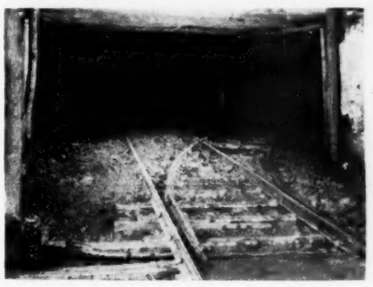
New low 14BU loader

four-wheel-steer shuttle car with battery control (also built in cable-reel type), has extra clearance for operator efficiency; new low heavy-duty 14BU loader, 7½-hp. Caterpillar motor, 36 in. high, 5- to 8-ton-per-minute unit; standard heavy-duty 11BU loader, has finger-tip hydraulic control and individual motor-driven hydraulic pump mounted in bumper.

•

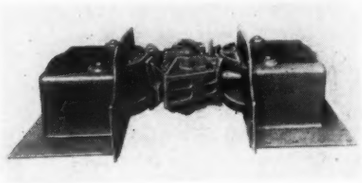
MINE TIES

Koppers Co. (Wood Preserving Division), Marietta, Ohio, stresses that Ar-Moored mine ties were designed primarily for working-section tracks of mechanized coal mines. Their use, according to the manufacturer, results in high-ton-hour-capacity tracks, elimination of delays and increased safety in the working sections. Most Ar-Moored ties are manufactured 3 in. thick, but 4- and 2-in. sizes also are made. They appear to have an even larger field in main haulage tracks where the coal is low.



AUTOMATIC CAR COUPLER

National Malleable & Steel Castings Co., Cleveland, Ohio, announces an improved Willison automatic mine-car coupler, mounted on a car in a spring-cushioned draft gear assembly, all buffing or pushing loads are



transmitted to the cushioned buffing member directly from the coupler head. Using this improved mounting, says the manufacturer, long trips of cars may be pushed on tangent track, around curves and over special track arrangements without having cars twist with respect to the center line of track even though the clearance between track and wheel should be excessive.

•

PHOTOELECTRIC CONTROL FOR PLANT ALARM

Photoswitch, Inc., Cambridge, Mass., has developed a photoelectric control to provide a warning signal inside industrial plants in the event of an air raid. The control is placed in a convenient location so that it views a centrally controlled street lamp. Through the photoswitch are connected alarm systems operating inside the plant, and when the street lights are turned out, Photoswitch observes this and the alarm is sounded. The control is designed to operate independent of a momentary flickering of the street lamp, also independent of ambient light conditions.

•

CAST-STEEL AXLE

Duncan Foundry & Machine Works, Inc., Alton, Ill., announces a cast-steel axle cast integral with channel, dust collars and boxes. Made in one piece, the manufacturer points out, this eliminates a rolled axle, rolled channel, two shrunk-on dust collars and two cast-steel boxes—all vitally important mill shapes which cannot be procured easily. With the shortage of steel plate, it is pointed out that mine operators who wish to build their own cars, with wood, will find it practicable to utilize this unit. According to the company, tests reveal that the rolled axle bent at an angle of 30 deg. under pressure of 200 tons, whereas the new cast-steel unit stood a pressure of 225 tons before bending to the same angle.

•

BEARING WASHER

An adaptation of a production-type bearing washer for industrial plant use has been developed by Ahlberg Bearing Co., Chicago, to reduce the need for bearing replacements. The unit is easily portable and has a sealed compartment to prevent evaporation loss of the solvent solution. Provision is made for a compressed-air dryer which blows the bearing dry and clean, making the whole operation complete and easy in a minimum of time. The unit weighs only 10 lb. and handles a full range of bearing sizes.

An additional unit for repacking the cleaned bearing with fresh grease is a second development. With 5 lb. of clean lubricant in its base, the bearing is simply placed on top of the unit and a lever forces the clean grease completely through the bearing without waste or muss and without danger of dirt and contamination being carried in the lubricant.

•

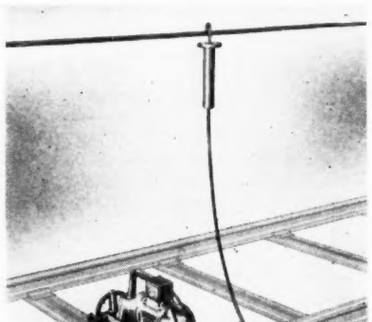
VIBRATING SCREEN

Robins Conveying Belt Co., Passaic, N. J., has substantially redesigned its Style "M" Vibrex screen, a lightweight model for fine sizing. Features are a powerful vibrator correctly located, strong stabilizing springs, stiff, deeply trussed line frame and rigidly mounted screen cloth.

•

ELECTRIC DRILL AND GASPROOF STARTERS

Ohio Brass Co., Mansfield, Ohio, announces the new electric Mobildrill, especially designed to supplement wedge bonding programs. The manufacturer feels that the wedge bond is the answer to the need for rail-laying speed in modern mechanized mining. Simple, easy to apply and easy to reclaim, this bond is said to permit the convenient maintenance of an adequate return circuit at all times. This new portable drill weighs but 58 lb. and can be carried from joint to joint by one man. Trolley connection is made by a fused trolley tap which also provides overload protection for the motor.



Rail connection is provided by an insulated junior plier-type ground clamp. Adjustments make it easy to set up the drill to handle any bottom condition. The drill is fed into the rail by a handwheel-operated screw. Drilling time for a 40-lb. rail is about 40 seconds. The drill is operated by a ¾-in. drill motor using 250 volts d.c. Rail weighing from 16 to 65 lb. may be drilled.

Another item is the Mechano plug for 6-conductor cable. This plug is designed especially for making connections to reversible motors.

Two new gasproof starters are ready. The first of these is the BGD unit, especially designed for conveyor motors. It provides differential timing, keeping the motor on resistance for a length of time directly proportioned to the amount of load. The other variation of this starter is the BMG design, which employs fixing timing via mercury switch. Both of these starters are available with speed-regulating rheostat and/or reversing switch.

•

COAL DRYER

Link-Belt Co., Chicago, features the Roto-Louvre dryer, said to be an entirely different, highly efficient, thoroughly proved machine that dries without degradation and without heating material excessively. Besides drying quickly and thoroughly other advantages claimed for these units are: cut drying costs, improve drying operations, use less floor space, eliminate obsolete equipment, and save on heat and maintenance.

•

SPOUT MAGNETS

Stearns Magnetic Mfg. Co., Milwaukee, Wis., stresses the advantages of spout magnets in coal mines and distributing plants because of their ready adaptability to conveying systems. In some cases, says the manufacturer, they are preferable to magnetic pulleys because of position and space requirements.

•

SHUTTLE-CAR BATTERY

Pointing out the part played by the storage battery in the progress of mechanization, Gould Storage Battery Corporation, Depew, N. Y., announces design of a Kathanode battery-type KSHD especially for shuttle-car propulsion. Featuring the Kathanode principle of design, it embodies mechanical construction features that are said to adapt it for this heavy-duty service.

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UNDERGROUND BELT CONVEYOR

Barber-Greene Co., Aurora, Ill., offers an underground belt conveyor. The steel-trussed belt conveyor frame, developed for the contracting field, has been applied to underground belt conveyors for mines. In mines, where headroom is limited and long spans are not required, a 12-in. depth of frame was decided upon, giving a belt height about the same as is found on the channel frame or pressed-steel frame generally used underground. Advantages claimed for this type of construction are: (1) permanent, accurate belt alignment, thus obviating edge wear of belt, tearing at splices and general abuse at loading points; (2) permits use of sloping self-shedding deck, preventing accumulation of coal generally found on flat deck; (3) fewer supporting ties required; (4) saving of labor in maintaining alignment.

AIR COMPRESSOR

Gordon Smith & Co., Bowling Green, Ky., presents a new model air compressor designed to perform an important service to miners wherever a lightweight portable compressor is needed. Model 100 is equipped with a new Model B Ford motor and the patented Smith compressor head. With two cylinders compressing air and two cylinders used for power, the displacement at 1,500 r.p.m. is 87 cu.ft. per minute—the actual air delivery at 1,500 r.p.m. is 60 cu.ft.

General specifications of the Model 100 are: Pierce centrifugal industrial type governor, Model B Ford water pump, silencer type air cleaners on compressor, R. C. Conrader pilot valve, 13-plate standard battery, 4-blade truck-type fan, $1\frac{3}{4}$-in. axle, ball and socket hitch, 16x44-in. A.S.M.E. 100-lb. W.P. air receiver, lever-type pop-off valve set at 150 lb., high-speed strip-type compressor valves, automatic unloading and idling features. The frame, radiator shell, hood, cowl, wheels and hubs are used Model A Ford parts that have been completely refinished.

•

BATTERIES

Shuttle-car and locomotive batteries share the spotlight among products of the Electric Storage Battery Co., Philadelphia, Pa. Cutaway cells showing the Exide-Ironclad battery's rugged construction are a feature of Exide displays. These include Exide-Ironclads having capacities of 1,080, 1,000, 500 and 340 amp.-hr. each. There also is a 48-cell TLM battery used for shuttle-car service.

•

CUTTING MACHINES

Many months before Pearl Harbor, the management of Sullivan Machinery Co., Michigan City, Ind., decided to bend every effort toward greater production in the following five main types of coal cutters: 11-B

7-AU track cutter

shortwall (20, 35 and 50 h.p.), 7-B shortwall (50 h.p.), 5B-1 shortwall (10 h.p.), 9-B adjustable floor-type overcutter and 7-AU universal type track cutter. As continual improvement is the rule for all Sullivan coal cutters, many minor engineering changes incorporated are contributing to longer life and easier operation of these machines.

•

PILLOW BLOCK

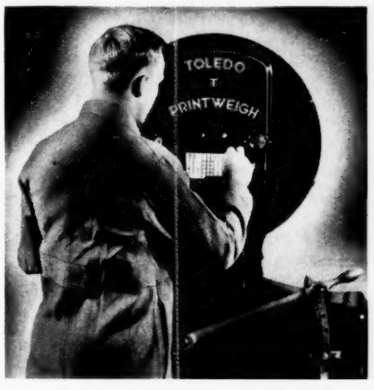
SKF Industries, Inc., Philadelphia, has refined the design of the SA and SAF type pillow block to obtain a streamline effect, greater lubricant space, maximum strength with minimum weight, and complete protection for the bearing. Made in a complete range of sizes, it is said to be applicable for use with either the ball or roller types of SKF self-aligning bearings.

Both ball and roller bearings are obtainable for mounting in journaled shafts (using the straight-bore bearings or for straight shafts (using the adapter type mounting). With these two types of mountings available all variations of bearing applications are possible. SA pillow blocks are available in either the free or the held type. When it is desirable to locate the shaft a locating ring is applied between the face of the outer race of the bearing and the housing shoulder. This ring provides flexibility, the ability to transfer the rings from one housing to another or to omit them when a free bearing is desired.

•

WEIGHING EQUIPMENT

Several new advantages have been incorporated in the new series of weight-printing scales of the Toledo Scale Co., Toledo, Ohio. These feature the integration of the printing operation with the weighing mechanism, split-second speed in printing weights, and large, especially designed weight figures that



are easy to read. The printing wheel is a direct part of the scale—revolving on the same ball-bearing shaft as the scale indicator hand and responding to scale loads in the same manner as the automatic dial scale. Printweigh records may be made in weight-sheet or ticket form, continuous paper-roll strips, or a combination of these.

•

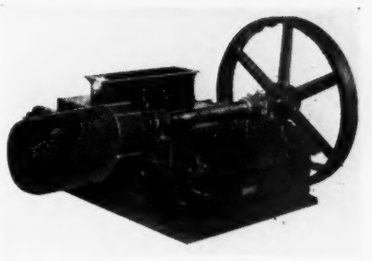
COAL-WASHING TABLE

Deister Concentrator Co., Fort Wayne, Ind., offers an improved diagonal-deck coal-washing table, the Super Duty No. 7. It is a refined and improved model similar to its predecessor. The new model is said to be distinctly keyed to war economy; the manufacturer says it will continue to operate easily and efficiently in the hands of unskilled washery attendants. It includes factory-aligned all-steel subframe mounted on a 9-in. rugged steel main channel base.

•

COAL CRUSHERS

Williams Patent Crusher & Pulverizer Co., St. Louis, Mo., offers single- and two-roll coal crushers. The single-roll unit, which comes in two sizes—24x24 and 24x36 in.—is said to give very good results for coarse work such as stoker coal and larger sizes. The two-roll type is especially recommended where the feed is relatively small and a uniform product is desired. Some of the latter are used for secondary work to make small sizes with a minimum of extreme fines.



Two-roll crusher

Frame of two-roll unit is of heavy gray iron castings with one roll in fixed position and one floating roll. Clearance between rolls is adjusted by shims and roll is held in that position by heavy springs which afford relief when uncrushable material enters by accident. Drive from crusher countershaft is by heavy-duty roller chain operating over sprockets connecting the two rolls. Eight sizes—from 14x12 to 20x24 in.— are available.

•

COAL SCRAPER, BROOM AND SCREEN DECK

Emphasizing new uses for proved equipment, Allis-Chalmers Mfg. Co., Milwaukee, Wis., points out that its diesel tractor and Gar Wood scraper strips between 400 and 500 yd. of overburden and also is proving a very economical coal carrier, handling 15 tons at a time.

The A-W "W-Speed Patrol," equipped with a Hough steel broom, is said to save 80 man-hours per day when sweeping coal (reducing the ash from 1 to 2 percent). Some operations also use it to drag power cable around the high wall and to build and maintain haulage roads.

Increased efficiency and capacity for coal screening, as well as savings in high-grade steel for cloth replacements, are claimed for a new 4-way deck for A.C. screens. The new longitudinally tensioned and longitudinally crowned deck can be supplied with both Ripl-Flo and Low-Head units. Capacities for a given screen area are greater with the new deck because of a more uniform bed thickness. This results from lengthwise tensioning along the screen, providing a flat transverse section.

With the new style deck, cloth replacements are cut nearly to half, because the deck is interchangeable and reversible. For dewatering service the 4-way deck is said to be especially effective. Transverse buffer strips that support the cloth act as drip strips, preventing water from running down the screen.

SCALES, PUMPS AND MOTORS

Fairbanks, Morse & Co., Milwaukee, Wis., offers motion weighing mine-car scales, Angleflow pumps, Builtogether pumps, Simplex power pumps, Copperspun rotor, right-angle gear drives, totally inclosed fan-cooled motors and splashproof motors.

•

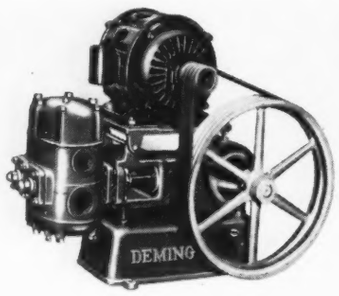
JACKS

Templeton, Kenly & Co., Chicago, announces a new line of Simplex hydraulic jacks made in 3-, 5-, 8-, 12- and 20-ton capacities. These feature non-slip forged-steel cap, overextension safety stop, pressure-tested malleable top nut and base. Neoprene non-deteriorating packing seals, and shielded release valve which cannot break off or jam and is turned by one end of jack handle which has a flat head to fit recessed slot in valve.

•

DOUBLE-ACTING PISTON PUMP

Deming Co., Salem, Ohio, calls attention to its "Duplex" double-acting piston pump, Fig. 2892, with multiple V-belt drive. Intended for mines where acid conditions are not extreme, this pump is designed for use where the vertical distance to the lowest water level does not exceed 25 ft. and the total head is not greater than 230 ft.



The power end consists of a heavy casting which includes the base and oil reservoir. The water end is bolted to the power frame. It is fitted with cast bronze cylinder liners which are renewable. Suction and discharge openings on both sides permit piping to be taken from either side. Pistons of the unit type, packed with hydraulic packing rings, can be adjusted for wear and easily removed from the back end of cylinder.

•

MINE-LOADER LUBRICATORS

Standard Oil Co. (Indiana) announces a new line of mine-loader lubricants, in four grades, known as Superla mine loader-lubricants Nos. 3, 5, 6 and 8. The new lubricants have been designed to meet the strain of continuous operation.

No. 3 is a heavy-duty thickened oil of the dripless type, for uses in loader gear cases, particularly where the hydraulic system is separate from the case. No. 5 is fibrous-type thickened oil to be used in loader gear cases requiring a product of this type and is said to be particularly useful in reducing consumption. No. 6 is a smooth-type thicker oil especially manufactured for gathering head pots; also suitable for transmission cases and high-speed bearings lubricated by pressure guns. No. 8, the heaviest grade, is used for pressure-gun application under conditions requiring a heavy-type lubricant, such as for armature bearings.

The new lubricants are said to show high stability under difficult operating conditions. Tests show low consumption, great load-carrying ability, great heat resistance, and a minimum of carbonization and deposits.

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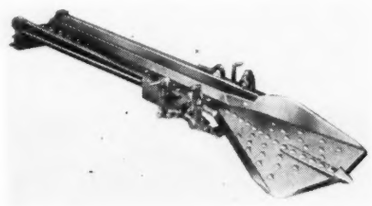
MINING EQUIPMENT

Goodman Mfg. Co., Chicago, announces a wide range of mining equipment including the Type 1224 hydraulically controlled track-mounted slabber, Type 460 track-mounted



Automatic duckbill

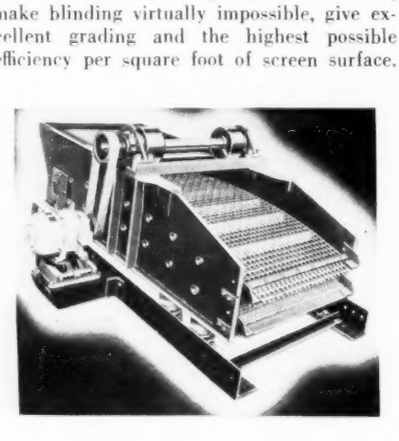
loading machine, shortwall coal cutters, shaker drives, duckbills, gearless vertical reel for gathering locomotives, vertical gearless reel, and Camtractor controller adapted to mine locomotives.

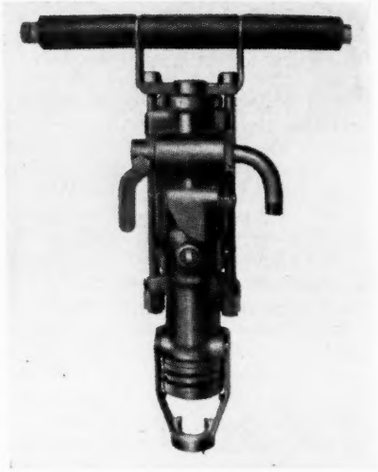
•

VIBRATING SCREENS

Deister Machine Co., Fort Wayne, Ind., offers Plat-O vibrating screens in sizes ranging from 2½x4 to 5x10 ft., available in one-, two-, three- and four-deck types. Increase in thickness of the side sheets, in the size of the tubes supporting the screen cloth, and a general heavier construction throughout have been carried down into some of the intermediate sizes.

To obtain maximum screening and sizing efficiency, the screen cloth or perforated plate is mounted and vibrated at as flat an angle as conditions will permit. In order to maintain continuous operation in the spreading of the bed of material and moving of the material from feed to the discharge end, there is, in addition to an effective vertical vibration a differential horizontal conveying motion. Because of the unusually high speed of the vibrating mechanism, the oversize material is moved rapidly off the screen. These characteristics, says the manufacturer, make blinding virtually impossible, give excellent grading and the highest possible efficiency per square foot of screen surface.





SINKING DRILL

Gardner-Denver Co., Quincy, Ill., calls attention to the S33 light sinking drill. Weighing only 31 lb., it is said to combine speed and reliability. Its light weight makes it easy to carry into hard-to-reach places and easy to hold in any position while serving a variety of uses.

•

WOOD PRESERVATIVE

Osmose Wood Preserving Co. of America, Inc., Buffalo, N. Y., points out that when it is necessary to make field bolt holes and field cutoffs on treated timbers, Osmoplastic applied to the joinery and bolt holes offers maximum protection against rot caused by moisture working into the unprotected, vulnerable areas. In locations where it is impossible to obtain treated timber sets, says the manufacturer, Osmoplastic applied correctly at the vulnerable areas will lengthen the replacement cycle. The same holds true of seats, joineries, cut-offs and bolt holes when it is impossible to obtain treated ties and car-bottom lumber. Osmoplastic is quickly and easily applied with a brush by any workman at very low cost.

•

HARD-FACING RODS

Air Reduction Sales Co., New York City, announces that the Stoody Co. has developed two new hard-facing alloys which are being marketed under the tradenames of Stoodite K and Stoody Self-Hardening K.

Stoodite K is a cast hard-facing rod consisting principally of molybdenum, tungsten, manganese, silicon, carbon and iron. It is supplied both in bare form for oxyacetylene application and in coated form for d.c. electric application. Deposits of Stoodite K average 54-58 on the Rockwell C scale, depending on the type of parent metal and the type of application. It is said to form smooth dense deposits free from porosity and shrinkage cracks. These deposits will withstand considerable pressure and impact if properly supported, and they offer excellent resistance to all types of abrasive wear.

Stoody Self-Hardening K is composed principally of molybdenum, manganese, silicon, carbon, vanadium and iron. This rod is supplied bare for oxyacetylene application and bare and coated for d.c. electric application. Deposits average 50-54 on the Rockwell

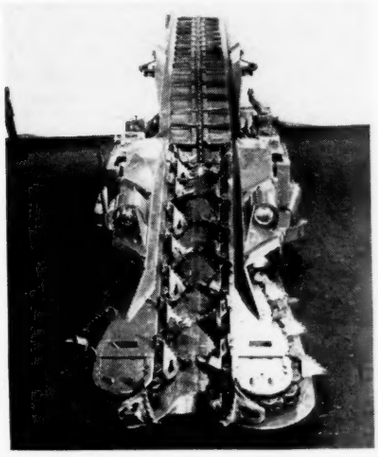
C scale, depending on the type of parent metal and the method of application. In addition to being highly resistant to wear it also will withstand considerable impact if properly supported. It forms an excellent bond with manganese steel and can be used for hard-facing various types of manganese equipment. Deposits can be forged provided forging is done at red heat.

•

PLASTIC-BLADE FANS, LOADER

Jeffrey Mfg. Co., Columbus, Ohio, has substituted plastic blades for aluminum blades in its mine fans. The manufacturer is using a laminated plastic construction, which appears to have properties superior to aluminum in respect to safety factor, surface texture and chemical inertness.

The track-mounted L-600 is a companion to the L-500 loader, having similar features but suitable for higher seams. It has antifriction journals and transmission gearing



in oil-filled case, hydraulic control of all clutches and movements of the machine. It cleans up a place 28 ft. wide. Autospooling electric reel pays out cable on operator's side. One motor provides all power requirements. Arc of swing gathering head, 116 deg. Width of head at point of timber clearance, 50 in. Suitable for seams over 4 ft. thick.

•

ELECTRICAL INSULATION

With America's mines, factories and shipyards facing the greatest production challenge in the nation's history, Owens-Corning Fiberglas Corporation, Toledo, Ohio, points out that electrical and maintenance engineers find increasing need of various types of electrical insulation to provide both new and existing electrical equipment with the greater ruggedness required to minimize breakdowns under heavy and often continuous overload.

In the form of cloths, tapes, sleeving, tying cords, laminated sheets and fiberglas-mica combinations, Fiberglas insulation, when correctly applied, according to the manufacturer, effects a radical reduction in insulation failures, recognized as the main cause of electrical equipment breakdowns. Among the properties claimed for this insulation are high insulation resistance and dielectric strength, and ability to withstand the effects of heat, moisture, acids and corrosive vapors.

COAL CRUSHER

American Pulverizer Co., St. Louis, Mo., recommends the "AC" rolling ring coal crusher for reducing efficiently the slow-moving sizes of coal to domestic stoker sizes. The adjustable grinding plate and adjustable drop-bottom cage permit varying the clearance between the rotor; by adjusting these members the operator can obtain any size product within the crusher range. All adjustments are made externally and while the crusher is in operation.

The patented shredder rings split the coal rather than crush it, being designed to maintain their outward position by centrifugal force at a slow speed. No toggles or cams are employed and when encountering non-crushable material the rings are free to swing back on their shafts, thus affording protection against injury from tramp metal.

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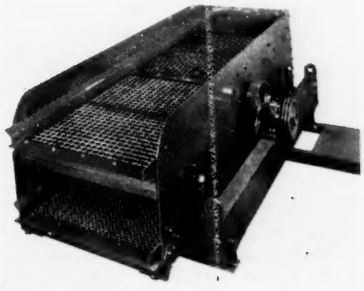
SCREEN

Screen Equipment Co., Buffalo, N. Y., offers the Seco screen, which uses an eccentric shaft and the circle-throw motion of the screening body. Balance is maintained by balance wheels with adjustable counterweights. A patented equalizer assembly connects the body to the base frame with steel links, eliminating springs or other resilient supports and controlling the gyrating motion of the screen body.



The equalizer assembly consists of two cold-rolled steel shafts running longitudinally with the screen inside the base frame; six to eight steel-and-rubber bushings pressed on these shafts and housed in cast-iron pillow blocks to allow the slight oscillating motion of the shafts; four cast-steel arms keyed to the shafts at the four ends and equipped with ball pins for connecting the vertical links; four cast semi-steel links connecting the ball pins on the arms to similar ball pins attached to the side plates.

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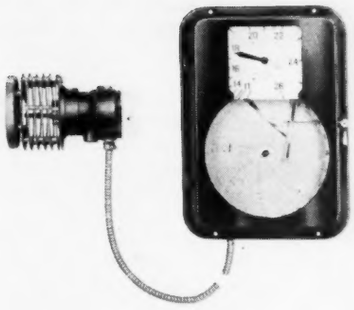
RADIATION PYROMETER

A new radiation pyrometer, known as the Pyrovac, has been developed by the Bristol Co., Waterbury, Conn. This instrument is designed for recording, indicating or automatically controlling temperatures in furnaces and kilns above 900 deg. F. The temperature-sensitive unit or radiation head is mounted on the outside of the furnace out of the hot zone, where it picks up heat rays emitted from the object under measurement, thus registering its surface temperature.

The Pyrovac is intended for use in measuring and automatically controlling tempera-



tures that fall into the following classifications: (1) high temperatures out of the range of the thermocouple; (2) temperatures for which rare-metal thermocouples are used; (3) surface temperatures, such as roof, wall, duct, lining or retort temperatures and the temperature of the work itself rather than that of the space in the kiln surrounding the work; (4) where the object is moving, is inaccessible or where there are space limitations.

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MINE PUMPS

Pomona Pump Co., Pomona, Calif., offers mine pumps to be used in many types of mine pumping applications. According to the company, the motor heads are designed for the job; pumps are easy to install, can be quickly serviced, stay on the job, are highly adaptable and save on power.

•

USE COMMUNICATION SYSTEM FOR AIR-RAID CONTROL

A new application has been developed of a standard two-way communication system made by Executone, Inc., New York City, and is now in use by a force of air-raid wardens to control plant employees. An

auxiliary amplifier at the master location permits high-power broadcasting of simultaneous messages to all of the remote stations. The master station is arranged with an annunciator type of pushbutton selector to call or receive calls from individual remote stations. Thus the equipment serves for normal use as well as for emergency.

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CONVEYOR BELT AND RUBBER HOSE

Manhattan Rubber Mfg. Division, Raybestos-Manhattan, Inc., Passaic, N. J., has introduced Homocord, an entirely new type of conveyor belt. It is said to combine the extreme flexibility of cord construction with the ability to hold metal fasteners to a degree

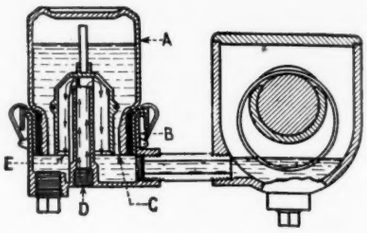
previously approached only by fabric construction and with added qualities which notably increase life and tonnage capacity. As a result of progressive studies of the causes of failure and of ways to overcome them, a different type of cord was developed and then new body construction was invented to meet the requirements of conveyor belt use. Features claimed for it are correct proportioning of lengthwise and crosswise strength and flexibility, low inelastic stretch, resistance to fatigue and impact, equal life in body and cover, and other essential qualities.

As a result of its latest development in hose construction, the company announces Condor Homo-Flex hose. Among advantages claimed are: extreme flexibility, lightness in weight, ease of handling, inseparable covers and plies, uniform diameters, and less elongation and expansion. It is manufactured in 50-ft. lengths on accurate steel mandrels in several types that cover a wide variety of service. Among these are air hose, water hose, mine spraying hose, air-oil and oil spray hose.

•

LUBRICATOR

Oil Rite Corporation, Milwaukee, Wis., offers the new Oil Rite constant-lever lubricator. Holding a visible reserve supply of oil, it is said to release automatically as much as is needed to maintain adequate lubrication at all times and prevent oil waste and the deterioration or spoilage of material caused by oil throw. It is used on electric motors, pillow blocks, pumps, air-conditioning equipment, ventilating fans, gear boxes—wherever bearings and other machinery parts must be provided with an ample supply of lubrication.



The unit consists of only three simple parts. The base is cast of Zamak metal, with an integral open-air vent which extends part way up into the oil reservoir. Over this vent is fitted loosely an inverted bucket, or bell, also cast of Zamak metal. The reservoir proper is a glass dome, sealed to a metal collar by plastic porcelain cement which is said to be impervious to acids, oils, water and heat. Two spring clips lock the oil reservoir in position. A felt gasket around the outside of the bell seats against the narrower neck of the glass dome when the reservoir is removed, preventing waste of oil during refilling.

When the reservoir—*A* in the diagram—is filled and inverted into position on the base, *B*, the lower edge, *E*, of the inverted bucket determines the oil level which the lubricator will maintain. When the level falls below this point, air from the vent, *D*, escapes under the side of the bell—as at *C*—up to the top of the lubricator, permitting oil to flow down until the level to be maintained again seals across the base of the bell. Operation is entirely automatic.

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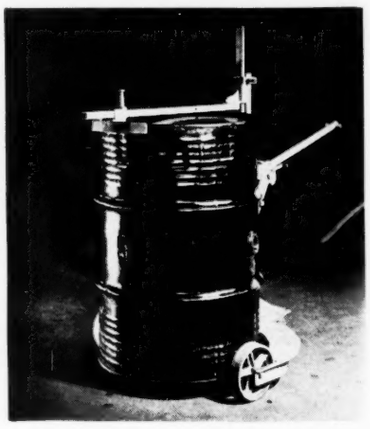
BARREL CARRIER

A new drum and barrel carrier is announced by the Ernst Magic Carrier Sales Co., Buffalo, N. Y. Its capacity is 800 lb. and it will accommodate drums and barrels from 14 to 24 in. in diameter. Three-wheel construction automatically balances the load for safe and easy moving of containers. Operation is said to be so simple that one man can attach the clamp, pull down on the handle, lift the container off the floor a few inches, and move it any distance. Another important feature is the straight, vertical lift of the barrel from the floor to prevent any flowing over of contents from open-head containers.



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EMERGENCY REPAIRS

Mines must run—repairs are needed from time to time—therefore, HOLMES has added an emergency repair department as an aid to mines in avoiding serious delays in production. The moment you need repair work, phone 1430 Danville, Illinois and a HOLMES representative will be on the way at once.

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REPLACEMENT EQUIPMENT

Mines today are looking ahead to their needs—we want to help you in this—try to foresee what you will need in HOLMES equipment and write us now so that we can anticipate our raw material requirements and plan our production accordingly, thus rendering a more complete service in keeping with Uncle Sam's War production program.

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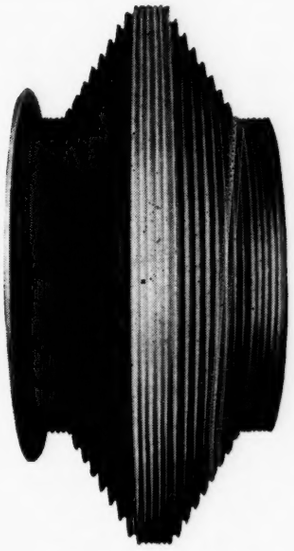
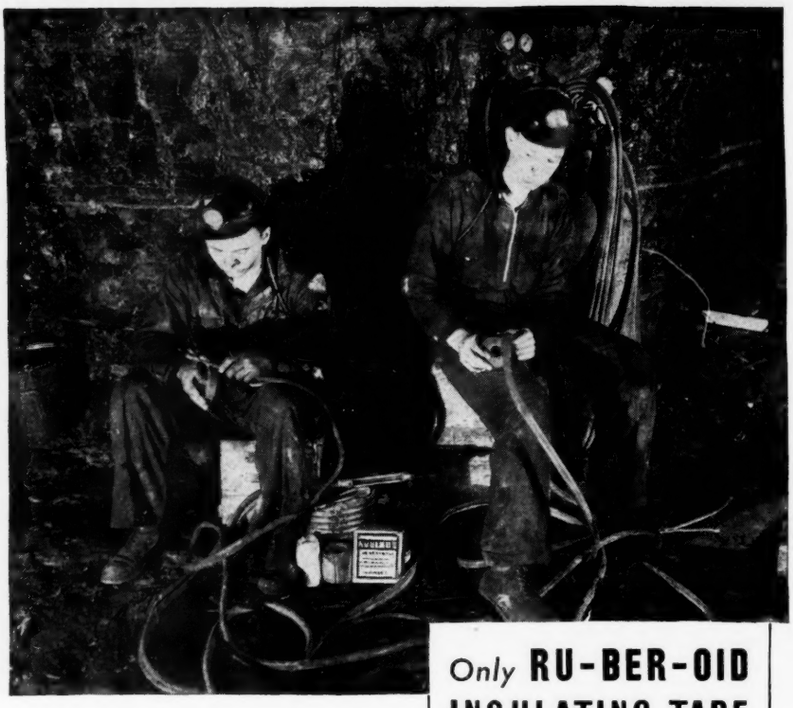


WINDING DRUMS

Sectional Bottom Conveyors

Conveyor bottoms will wear out but you can avoid costly shut downs with HOLMES sectional cast iron bottoms. Worn sections may be replaced by one man in a few minutes without removing chain or flights. These bottoms are in use on a variety of standard conveyor troughs. Write us regarding your conveyor problems.

When worn cable is hard to replace . . .
KEEP PRODUCTION MOVING BY USING THIS 7-FEATURE TAPE!



Read over, once again, the *seven* features of RU-BER-OID Heavy Duty Insulating Tape. Only Ruberoid has *all* seven!

And that's *important* to you and your company. For today, when production *must keep* moving—and new cable is difficult to get—you must depend more and more on insulating tape, for cable splices.

So be *sure!* Buy the heavy duty insulating tape you *know* will reduce production delays and power losses, and save you money.

RU-BER-OID Heavy Duty, Double Grip Insulating Tape *stays put* regardless of climate or temperature. It *provides* thorough insulation in one extra-thick covering—*resists* acids, alkali and moisture—*lasts* in spite of abrasion by sharp coal. Grimy or oily hands fail to loosen its grip.

Your supply house has RU-BER-OID Insulating Tape. Specify it. Use it—and find *all* the time-saving, money-saving features.

Only RU-BER-OID INSULATING TAPE *has all these 7 features*

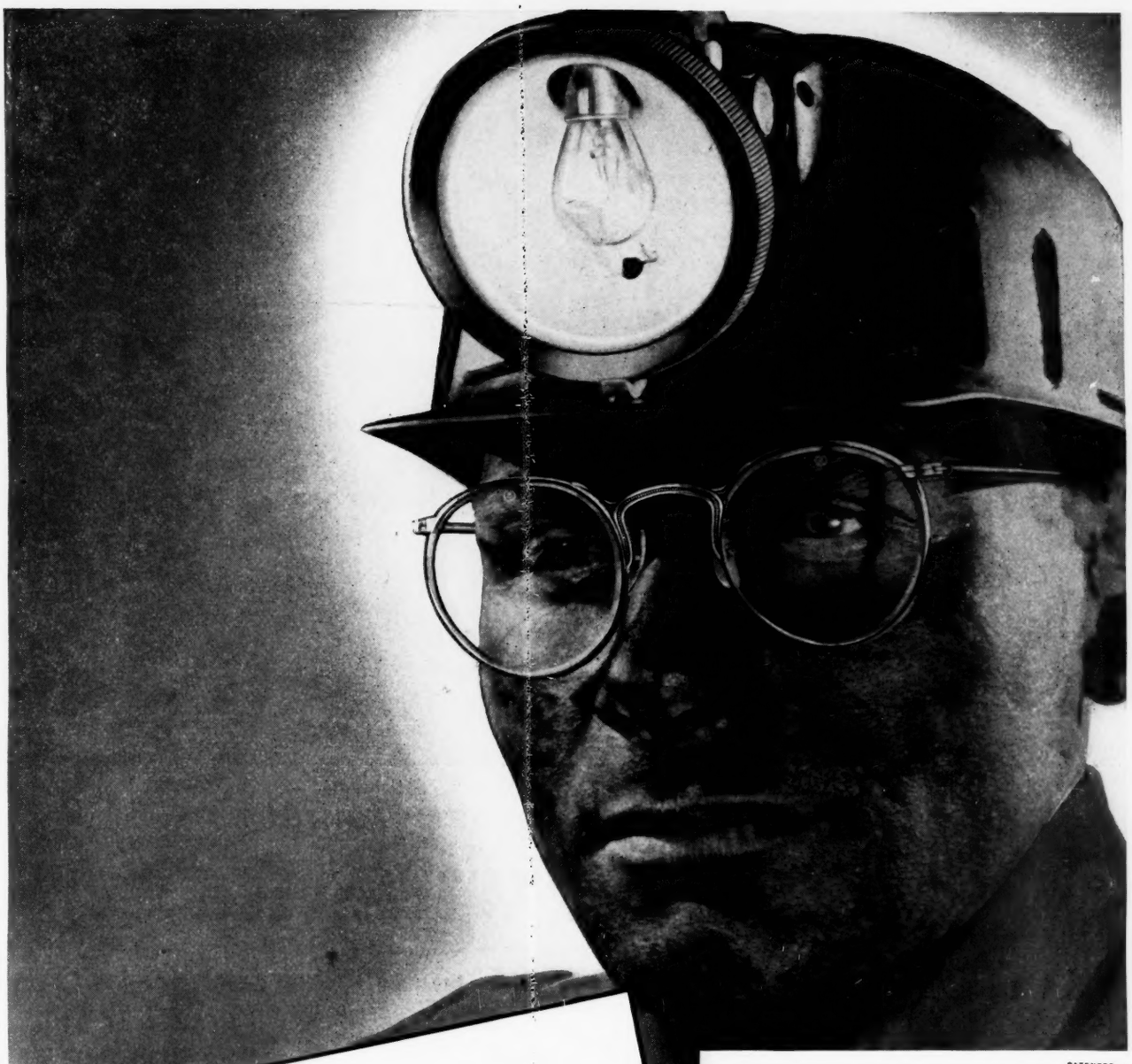
1. Double grip . . . both sides adhesive
2. Great tensile strength . . . tough
3. Won't tear, ravel or pucker
4. Resists abrasion
5. Acid- and alkali-proof
6. Extra thick . . . one layer insulates
7. Exceeds A.S.T.M. specifications by 300% in adhesiveness, 26% in tensile strength, 290% in dielectric strength

RU-BER-OID
INSULATING TAPE

OTHER RU-BER-OID PRODUCTS FOR COLLIERIES

ROLL ROOFING
ASBESTOS-CEMENT SHINGLES
ASPHALT SHINGLES
INSULATING PAINTS
BUILT-UP ROOFS
ASBESTOS INSULATIONS
ASBESTOS AND MAGNESIA PIPE COVERINGS
ROOF COATINGS
PATCHING PLASTIC
CORRUGATED ASBESTOS-CEMENT ROOFING AND SIDING

THE RUBEROID CO., EXECUTIVE OFFICES: 500 FIFTH AVENUE, NEW YORK



Model Eye Protection that helps make Model Mines THE AMERICAN LINE OF GOGGLES

PATENTED

No matter how up-to-the-minute a mine is in every *other* way, it cannot be a model mine unless all its miners wear goggles. For—without goggles there are eye injuries . . . and eye injuries raise cost-per-ton and lower company morale.

The American Line of Goggles are really models of perfection in safety, lightness, coolness and comfort. They are good-looking, too . . . especially the Ful-Vue. Equipped with Deep-Curved Super-Armorplate Lenses, American Goggles offer *extra* resistance to impact—making eyes and company dollars doubly safe.

Ask your M. S. A. Representative to show the complete American Line.

American Optical Company

Southbridge ***Massachusetts***

REPRESENTED IN THE COAL MINING INDUSTRY BY MINE SAFETY APPLIANCES COMPANY, PITTSBURGH, PA.

HAULING JEEPS ACROSS RAVINES

Another Job for Wickwire Rope

There are many *extra* jobs that wire rope must do today. The Army, the Navy, and the Liberty Fleet need vast quantities of wire rope.

This points up the message: MAKE YOUR WIRE ROPE LAST LONGER.

When wire rope fails too soon, it wastes badly needed steel, labor and time. If by care you can make *your* wire rope last longer, you are helping to win the war.

When you *do* need wire rope, be sure to get the correct type and size for your service. Our representatives will help you determine the best Wickwire Rope, preformed or Wissco lay, for your use—and after installation will help you get longest life and most economical operation from it.

The reason for the long life of *Wickwire* rope lies in our controlled production, every step of the way from ore pile, to blast furnace, to open hearth, to finished rope.

• • •

Have you a copy of the book "Know Your Ropes"? It will help *you* get longer rope life. More than 25,000 wire rope users all over the world regard it as the authoritative guide to wire rope economy. For your free copy, write Wickwire Spencer Steel Company, 500 Fifth Avenue, New York, N. Y.

WHEN WIRE ROPE LEAVES ITS IMPRINT in sheave or drum groove, there is a filing action on the rope at every start and stop. Grooves having the slightest impressions should be machined and polished. This and forty more rope life-savers are pictured and described in "Know Your Ropes."

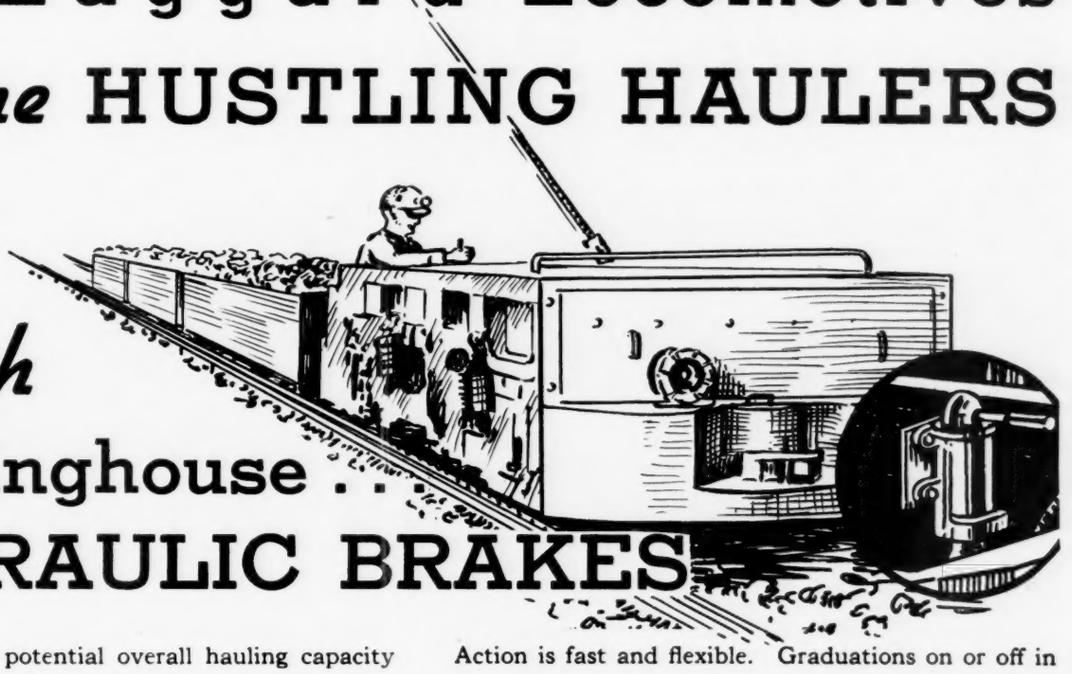
SEND YOUR WIRE ROPE QUESTIONS TO WICKWIRE SPENCER

WICKWIRE ROPE

Sales Offices and Warehouses: Worcester, New York, Chicago, Buffalo, San Francisco, Los Angeles, Tulsa, Chattanooga, Houston, Abilene, Texas, Seattle. Export Sales Department: New York City

WISSCO PRODUCTS

. . . Laggard Locomotives *become* HUSTLING HAULERS *with* Westinghouse . . . HYDRAULIC BRAKES

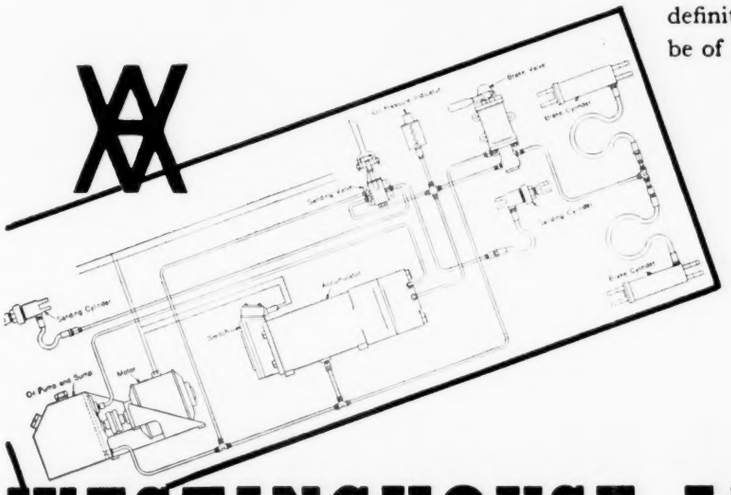


Something of the potential overall hauling capacity of your small locomotives is being lost when only hand brakes are used. Because these are slow-acting, and require physical effort to manipulate, operators all too often apply power against initially set brakes, or reverse motors to make a quick stop. Such makeshift practices to increase maneuverability throw abnormal load on electrical apparatus and mechanical elements, resulting in high maintenance costs.

The Westinghouse Hydraulic Brake corrects this condition. Its manipulation is simple and effortless. Action is fast and flexible. Graduations on or off in fine increments can be made at will. Any braking intensity required for proper control can be attained without delay.

Here then is a brake that will facilitate spotting of cars at loaders, and safely expedite haulage over tracks of varying profile. Moreover, tandem operation of two small locomotives for greater hauling power now becomes more feasible. Brakes can be installed on both units and manipulated from a single control position.

Westinghouse Hydraulic Brakes have proved to be a definite haulage helper on many properties. They can be of inestimable value for you also.



A simple, compact system, easily installed on small locomotives, new or old, where limited space precludes use of compressed air brake apparatus. Its source of power is a small volume of high pressure oil. It is controlled by a brake valve with which the retarding force develops in proportion to the operating handle movement.

WESTINGHOUSE AIR BRAKE CO.

INDUSTRIAL DIVISION - PITTSBURGH, PA.

We also build the following for mine service ★ Compressed Air Brakes for larger locomotives ★ Air Compressors, motor-, belt-, or steam-driven ★ "Savair" Cocks for air lines—efficient, durable ★ Air Storage Tanks—many types and sizes ★ "Flexair" Valves, for pneumatic control on shovels, hoists, etc.

Tools for producing more coal

The industrial front and the home front need all the coal you can mine. You can't afford to lose one second's production by inefficient blasting.

Build up your production, control your preparation, by shooting with Hercules Permissibles—Hercoal, Red H, Hercogel, and Collier Brands. One of these will shoot your coal efficiently—for either hand or mechanical loading.

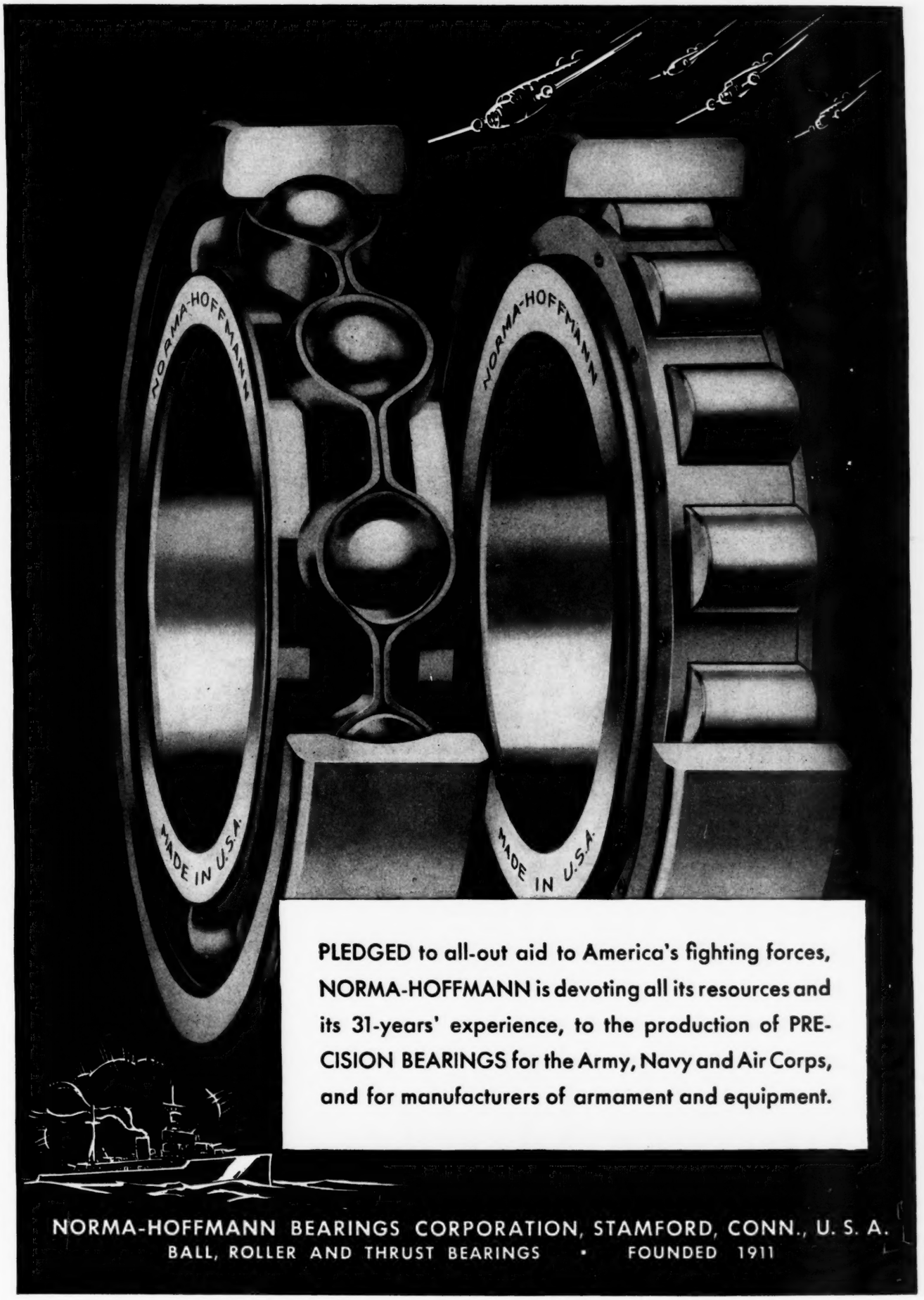
An experienced Hercules service man will gladly consult with you in selecting the most effective Hercules Permissible for your mine.

Write for complete information.

HERCULES POWDER COMPANY
INCORPORATED

B-38

936 KING STREET ★ ★ WILMINGTON ★ DELAWARE



PLEDGED to all-out aid to America's fighting forces, NORMA-HOFFMANN is devoting all its resources and its 31-years' experience, to the production of PRECISION BEARINGS for the Army, Navy and Air Corps, and for manufacturers of armament and equipment.

NORMA-HOFFMANN BEARINGS CORPORATION, STAMFORD, CONN., U. S. A.
BALL, ROLLER AND THRUST BEARINGS • FOUNDED 1911

Here's *Exactly* Why

The CONCAVE SIDE

Saves Belts-Saves Rubber-Saves Power!

Pick up any V-belt that has straight sides. Bend that V-belt while you grip its side-walls as in the picture above. You will feel the sides of the belt bulge out —as shown in Figure 1 on the right. Clearly, that out-bulge gives the belt a shape that does not fit its sheave groove.

Now look at Figure 2. There you see what happens when you bend a belt that is built with the patented Concave sides. You get a similar change in side-wall shape—but what a different result! The precisely engineered Concave side becomes perfectly straight. There is no out-bulge:—the full side-width of the belt *uniformly* grips the sheave groove wall. This means *uniform* wear—*longer* life—a saving in belts for you, a saving in rubber for the Nation. In addition, this full side-width grip on the pulley carries heavier loads without slippage—another saving of belts and a saving in power too!

Only belts built by Gates are built with the Concave side, a Gates patent.

What Happens When a V-Belt Bends

FIG. 1

FIG. 2

THE GATES RUBBER COMPANY

Engineering Offices and Stocks in All Large Industrial Centers

GATES VULCO ROPE DRIVES

Chicago, Ill.
549 West Washington

New York City
215-219 Fourth Avenue

Birmingham, Ala.
405 Liberty National Life Bldg.

Los Angeles, Cal.
2240 East Washington Blvd.

Denver, Colo.
999 South Broadway

Dallas, Tex.
2213 Griffin Street

Portland, Ore.
333 N. W. 5th Avenue

San Francisco, Cal.
2700 16th Street

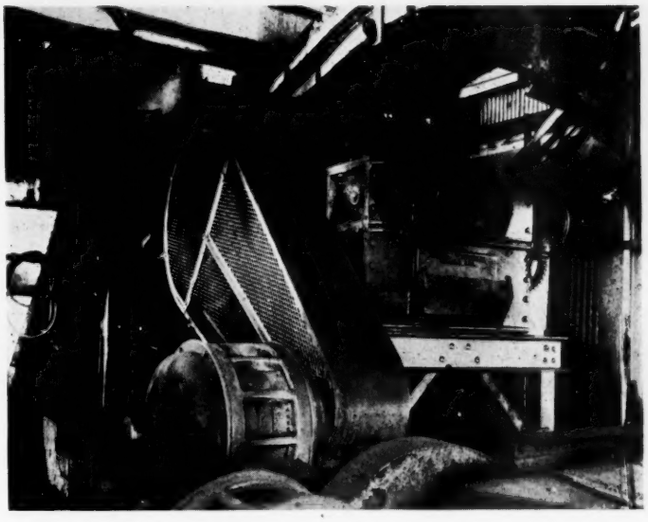
HELPING TO GET UNIFORM STOKER COAL SIZES TO MARKET QUICKLY

★ Now that the American public is being urged to fill the coal bins early to aid in making more locomotives, cars, and shipping space available for armament, the importance of the American Rolling Ring Crusher is emphasized.

Mines operating these crushers, and the list has grown enormously in the past 25 years, are in a particularly good position to crush huge tonnages quickly and not experience production delays due to maintenance.

Capacities up to 400 tons per hour are crushed day after day and it is not unusual for one set of crushing parts to crush several hundred thousand tons. All this is being done for less than one cent a ton including all costs.

The American Rolling Ring Crusher is built in many sizes and each unit arranged to meet the particular requirements of each application. Each is compact, externally adjusted, easily accessible, and powerful.



American Ring Crusher, type AC-3A, driven by a 100 hp. motor, crushing washed coal in preparation plant.

● To serve you efficiently, we would appreciate receiving from you, answers to the following questions—What is the largest lump size which you will feed crusher?—At what rate (TPH) would you contemplate crushing?—What stoker sizes do you supply?—How soon will you require an American Crusher? Your cooperation in this will help us materially in arranging our own production for the greatest good.

AMERICAN
"AC" Type
ROLLING RING CRUSHER

Patented reversible manganese steel SHREDDER RINGS

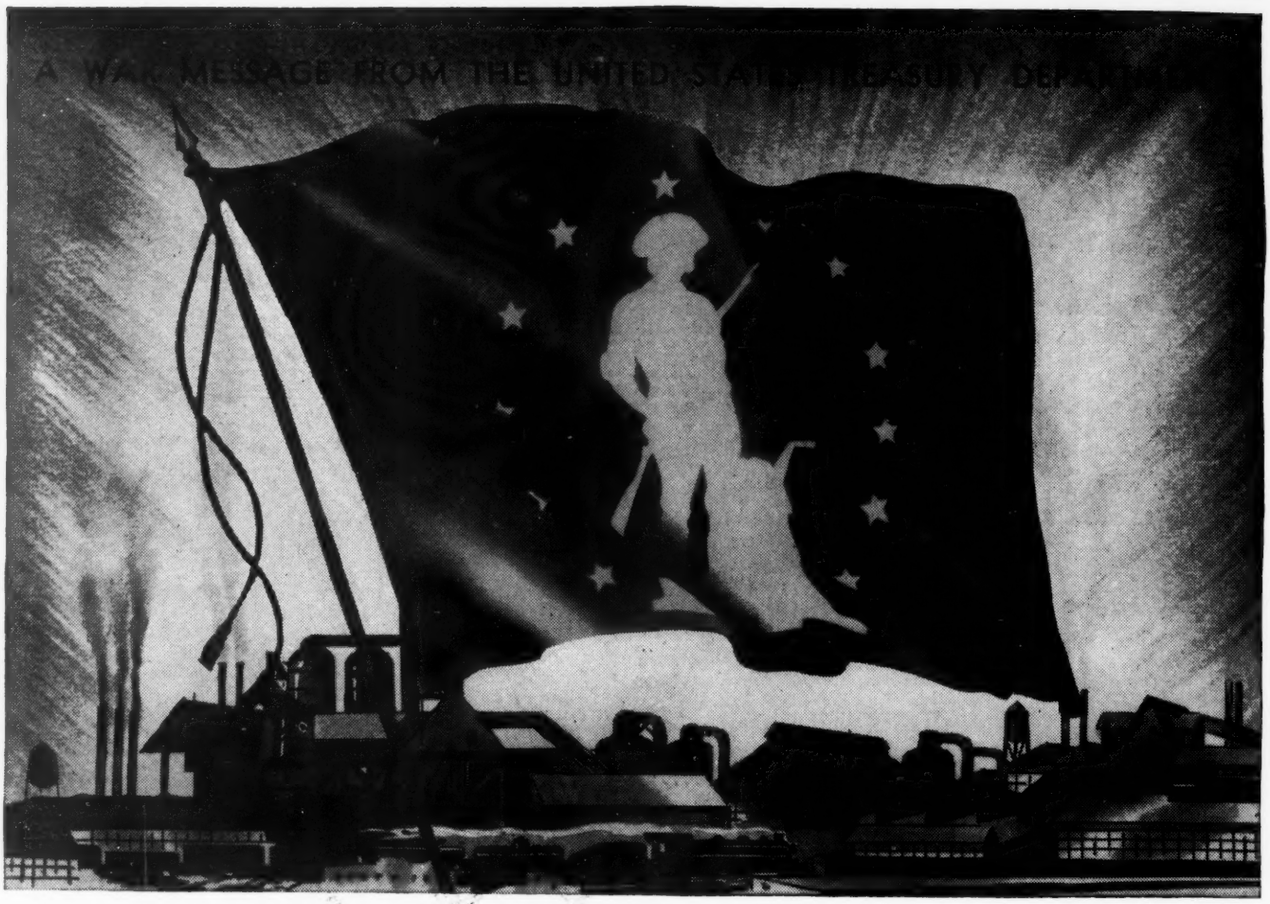
PATENTED

Revolving at a Slow Speed Make a Minimum of Fines

These rings split the coal rather than crush it. The rings are designed to maintain their outward position by centrifugal force at a slow speed. No toggles or cams are employed—when encountering non-crushable material the rings are free to swing back on their shafts—this means protection against injury from tramp metal. This patented SHREDDER RING is found only in the American Rolling Ring Crusher.

AMERICAN PULVERIZER COMPANY 1119 MACKLIND AVENUE ST. LOUIS, MISSOURI

ORIGINATORS AND MANUFACTURERS OF RING CRUSHERS AND PULVERIZERS



Next to the Stars and Stripes . . .

AS PROUD A FLAG AS INDUSTRY CAN FLY

Signifying 90 Percent or More Employee Participation in the Pay-Roll Savings Plan

IT doesn't go into the smoke of battle, but wherever you see this flag you know that it spells Victory for our boys on the fighting fronts. To everyone, it means that the firm which flies it has attained 90 percent or more employee participation in the Pay-Roll Savings Plan . . . that their employees are turning a part of their earnings into tanks and planes and guns *regularly,* every pay day, through the systematic purchase of U. S. War Bonds.

You don't need to be engaged in war production activity to fly this flag. Any patriotic firm can qualify and make a vital contribution to Victory by making the Pay-Roll Savings Plan available to its employees, and by securing 90 percent or more employee participation. Then notify your State Defense Savings Staff Administrator that you have reached the goal. He will tell you how you may obtain your flag.

If your firm has already installed the Pay-Roll Savings Plan, now is the time to increase your efforts: (1) To secure wider participation and reach the 90-percent goal; (2) to encourage employees to increase their allotments until 10 percent or more of your gross pay roll is subscribed for Bonds. "Token" allotments will not win this war any more than "token" resistance will keep our enemies from our shores, our homes. If your firm has yet to install the Plan, remember, TIME IS SHORT.

Write or wire for full facts and literature on installing your Pay-Roll Savings Plan now. Address Treasury Department, Section D, 709 12th St., NW., Washington, D. C.

Make Every Pay Day "Bond Day"

U. S. WAR Bonds ★ Stamps

This Space is a Contribution to Victory by COAL AGE

U. S. GOVERNMENT PRINTING OFFICE 16—27879-1 Form No. DSS-BP-4

This is number 10 in a series of informative articles prepared by Macwhyte Wire Rope Company. The purpose of this series is to help wire rope users in these critical times to get the longest possible service from present ropes . . . through making useful facts on rope care more widely known.

CORROSION IN WIRE ROPE

Corrosion is one of wire rope's worst enemies. It strikes without warning. It often reaches an advanced stage before being noticed. And even though checked it still leaves its imprint of destruction.

We can better understand corrosion (and how to prevent it) by knowing what it is, what causes it, where and when it is likely to strike.

What Corrosion Is

The dictionary defines corrosion as "an action of eating or wearing away by slow degrees; a gradual decay by crumbling or surface disintegration; a gradual breaking down of the material attacked."

Two General Classes

There are two distinct types of corrosion:

Acid corrosion, and

Alkaline (or salt) corrosion.

In the case of acid corrosion the wires become pitted and stress concentrates at the reduced cross-sections where pits are located. This causes premature failure of the rope.

In the case of alkaline, or salt corrosion, the wires become encrusted with a layer of the products of corrosion. The rope becomes rust bound, for example. Alkaline corrosion increases the size and weight of the steel wires.

Acid and alkaline corrosion both may occur when ropes are operating in (or subjected to) ordinary atmosphere or weathering, or special conditions which subject the rope to either acid or alkaline substances.

What Happens When Corrosion Sets In?

When this occurs the rope loses its flexibility. Then some of the wires are overloaded, which causes them to break. This is the "beginning of the end" for the entire rope. It starts to wear away rapidly.

No Way To Determine Rope's Safety Once Corrosion Sets In

Corrosion, probably the most severe type of deterioration, is the most difficult to evaluate. Ordinarily when internal corrosion has taken place, external corrosion is also present. But it is impossible to accurately estimate by any known means the remaining strength or safety factor of the rope once corrosion has set in.

More Information

The next advertisement in this series prepared by the Macwhyte Wire Rope Company will discuss ways of preventing corrosion, or in those cases where corrosion has gotten a start how to check it from doing further damage.

Feel free to write us on this, or any problem you may have. We are ready at all times to do whatever we can to help you get the most from your wire rope.

* * *

VICTIMS OF CORROSION!

These ropes never had a chance to live a full and useful life. Left unprotected against the elements, they were attacked and needlessly destroyed by the ever present wire rope saboteur: corrosion.

A very good example of Alkaline Corrosion. Notice how outside wires are partially eaten away—a rope unfit and unsafe. Crown wires have broken up. The other side of the rope next to the sheave has few broken wires . . . but if flexed in the opposite direction they would also break.

This rope was exposed to acid fumes which caused the wires to become brittle. This reduced their fatigue resistance and resulted in the wires breaking while bending over sheaves.

Macwhyte Company Manufactures:
MACWHYTE PREformed and Internally Lubricated Wire Rope
Monarch WHYTE STRAND Wire Rope
MACWHYTE Special Traction Elevator Cable
MACWHYTE Braided Wire Rope Slings
MACWHYTE Aircraft Cables and Tie Rods

NO. 618-C

MACWHYTE WIRE ROPE
Made by MACWHYTE COMPANY, Kenosha, Wis.
NEW YORK • PITTSBURGH • CHICAGO • FT. WORTH
PORTLAND • SEATTLE • SAN FRANCISCO
DISTRIBUTORS THROUGHOUT THE U. S. A.

You can assure a continuous supply of dustless treated coal by specifying

Not Limited by Order 156

Coaladd

Not An Oil

DUSTLESS TREATMENT FOR COAL

A Scientific Treatment

Coaladd is a colorless and odorless water-base compound of hygroscopic and film-forming materials. It is designed and manufactured for one purpose only — treating coal. It is shipped in bags and mixed with water before using. *It is less corrosive than water and has no detrimental effects on rubber or composition belting.*

Application Simple

Coaladd is applied at the mine by standard spraying equipment and, due to its composition, the atomized liquid spreads rapidly upon contact. No heat is required at any time.

Shipped Dry — Mixes Easily

Coaladd is shipped in 100 lb. weatherproof sealed paper bags. It is mixed with water, either just before it is used, or it may be mixed in advance and stored for future use.

Permanent Dustproofing

"Coaladd" treated coal is coated with a transparent protective film. This retards degradation due to oxidation. ***Coaladd*** treated coal may be stored indefinitely without change of rank. Since all the dust is tied down and the hygroscopic film is constantly renewing its moisture, the danger of spontaneous combustion in storage is minimized.

Coaladd protects against freezing. It reduces degradation. It retards segregation of fines. It decreases fly-ash. It protects stored coal against deterioration. It reduces the danger of spontaneous combustion. *But its main purpose is to reduce dust.* Every other advantage is incidental.

Coaladd is the only material that fulfills all the requirements of the producer, dealer and ultimate consumer.

Ask for complete details

Loading Untreated Coal — unretouched photograph

The same coal treated — unretouched photograph

A Product of

THE JOHNSON-MARCH CORPORATION

52 VANDERBILT AVENUE **NEW YORK, N. Y.**

Compound M and Coaladd for Complete Dust Control from the Face to the Furnace

BUILT BY FAIRMONT MACHINERY CO.

SKF

BALL AND ROLLER BEARINGS

Separating COAL *smoothly with* SKF

Like so many machines that depend upon SKF Bearings in the War Production effort, this American Twin-Dex Pneumatic Separator is always on the go. The reciprocating load developed by four connecting rods which shake the separator is imposed upon four SKF Bearings which withstand continuous shocks without fatigue. And SKF Bearings on main locations have built-in alignment to compensate for any initial misalignments. Where the call is for increased-schedule performance, machines invariably are SKF-equipped. 5055

SKF INDUSTRIES, INC., FRONT ST. & ERIE AVE., PHILADELPHIA, PA.

COAL

More Than Ever the Preferred Fuel-

MUCH of the market for liquid fuels will now turn back to coal. The coal industry thus faces the opportunity to demonstrate that in war or peace the industry is ready to heat American homes, adequately and comfortably, come what may.

With earnest attention to the problems of cleanliness, convenience and automatic firing, the coal industry can retain these customers who have returned to the fold. Coal has always been the economy fuel—the dependable fuel. It may well recapture now the few markets it has lost.

Many domestic users don't know of the improvements in grading coal for their convenience. They will find out when they again try coal.

Many don't know coal can be clean, dustless and odorless. They will find it can be if you treat all domestic coal with calcium chloride to make it dustproof. Be sure to use calcium chloride — then you'll have no odor, no added fire hazard and you'll get freezeproofing with your dustproofing application. Write for coal-treating literature today.

CALCIUM CHLORIDE ASSOCIATION
4145 Penobscot Building • Detroit, Michigan

CALCIUM CHLORIDE
FOR EFFECTIVE DUSTPROOFING AND FREEZEPROOFING

The greatest help a coal mining man can have—

IF YOU want to make sure of getting your certificate of competency—sure of winning a bigger job with bigger pay, get Beard's great books today and put them to work for you.

In these three books you have a practical, always-on-the-job guide that will help you solve the problems you face every day, show you what to do, tell you why it should be done.

Beard's
Mine Examination Questions and Answers!

3 volumes — $7.50, payable in four monthly payments

THESE books explain what a man must know in order to become a mine inspector, a mine foreman, assistant foreman, fireboss, hoisting engineer, safety engineer, shot-firer, etc.

They give you complete and authoritative information about air and gases, explosives, safety requirements and methods, mechanics, engines, hoisting, drainage, pumping, ventilation, timbering, instruments, and every other detail that the practical mining man must know.

Can you answer these questions—

What is meant by splitting the air current and what are the advantages derived from such methods?

Can a miner live in air in which the oxygen content is reduced to 17 per cent?

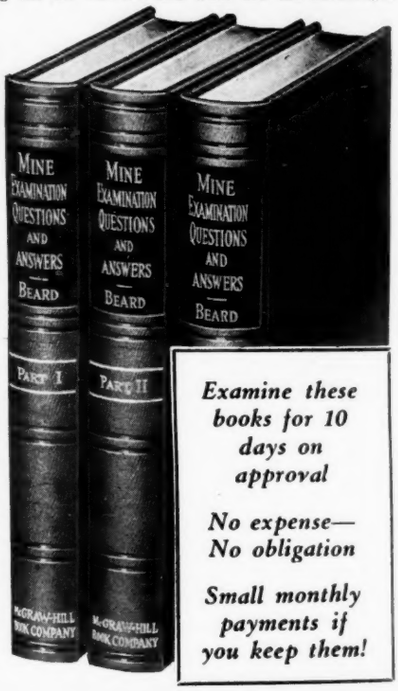
Name five duties imposed on mine foremen by law?

In what time can an engine of 40 effective hp. pump 4,000 cu. ft. of water from a shaft 360 feet deep?

What are the advantages and disadvantages of a gasoline pump, an air pump and an electrical pump?

What is the estimated tonnage per acre, per foot of thickness, for bituminous coal?

These are but a few of the more than 2000 questions given in Beard's books together with full correct answers. Hundreds of men have used this method to prepare for higher, better jobs. You can too, if you have the Beard books and plan to use them systematically. They are the best investment that a mining man can make—not only as an aid for passing examinations but as practical reference volumes on everyday mining operation problems.



Examine these books for 10 days on approval

No expense— No obligation

Small monthly payments if you keep them!

McGRAW-HILL ON-APPROVAL COUPON

McGraw-Hill Book Co., Inc., 330 West 42nd Street, New York

Send me, charges prepaid, **Beard's Mine Examination Questions and Answers**, 3 volumes, for 10 days' examination. If satisfactory I will pay $7.50 at the rate of $1.50 in ten days and $2.00 per month. If not wanted I will return the three volumes postpaid.

Signature .....

Address .....

City and State .....

Company .....

Position ..... C. 6-42

PROPER PREPARATION IS *Essential*

ONE outgrowth of the present war effort naturally is a demand for more coal. And if developments in the last war are any criterion, an important consideration in the future will be maximum reduction in impurity content, moisture content and other extraneous ma... con-
sideratio... are responsible for ... con...sion: (1) a proportionate allo...tion of the burden on transporta...tion facilities, as rock, water, etc., not only are useless but take up space that could be devoted to moving coal, and (2) maximum efficiency in use, especially in steam raising and metallurgy.

...may be assumed th... ...al ...or steam ... ...oal purposes will become more important, although this does not mean that domestic coal will take a back seat. In fact, as other fuels go more and more for industrial and military purposes, coal may be expected to take up the slack in the home-heating field. Here, also, good preparation is essential for economy and efficiency in use.

Judging from developments in the

From the February 1942 issue of Coal Age.

SUGGESTIONS TO INCREASE THE EFFICIENCY IN COAL PREPARATION, AND THE QUALITY OF THE FINISHED PRODUCT:

- Install mechanical cleaning methods wherever possible, to meet specific quality demands.
- Consider size simplification to meet heavier demand loads on any one size.
- Improve crushing practices and equipment.
- Extend preparation to include reclamation of good fuels now being wasted.
- Maintain closer control over finished product.
- Install automatic control equipment wherever possible.

TO THE NATION'S WAR EFFORT!

The ever-increasing demand for more and better coal has placed great emphasis on the *preparation* of coal, particularly when used in steam raising and metallurgy in conjunction with the war effort. In this respect, it is well to consider the facilities offered by FAIRMONT!

Primarily, FAIRMONT-built plants in operation at present *are serving the nation* by *really* cleaning coal . . . eliminating the shipment of waste on the country's already overburdened transportation facilities. Then, FAIRMONT-built plants, by turning out properly prepared coal, are assuring a full measure of energy per ton of coal burned . . . are holding graded coal up to its rated capacity. And, as a source for complete information on cleaning and preparing processes, FAIRMONT stands ready to serve the handling, cleaning, screening or loading needs of the industry. FAIRMONT is equipped to rejuvenate your present preparation plant, or to engineer, design and erect a new plant to meet expanded needs.

In short, FAIRMONT-built preparation plants, as well as FAIRMONT's advisory service to the industry, are essential parts of the coal industry's drive for greater and better production.

FAIRMONT MACHINERY COMPANY . . . Engineers, Designers and Erectors of Complete Preparation Plants, offering all types of preparation equipment . . . wet and dry cleaning systems, shaker and gravity screens, picking tables, loading booms, conveyors, feeders, car hauls, chutes, etc.

TRADE MARK REGISTERED

FAIRMONT MACHINERY COMPANY

FAIRMONT, W. VA.

WOOD PIPE for Mine Drainage

Wyckoff Wood Pipe has an 87 year record of perfect resistance to the corrosive action of sulphurous mine water. It is an ideal, long-time investment—light, easy to lay, and relatively low in first cost

We also manufacture a special Hard Maple Pipe for flushing culm in the Anthracite Region and wood covering for underground steam lines.

Established 1855

Emergency orders can be delivered by Truck to Mines in Pennsylvania Coal Fields following morning after receipt of same.

shipments from stock day after receipt of order. Send for catalog.

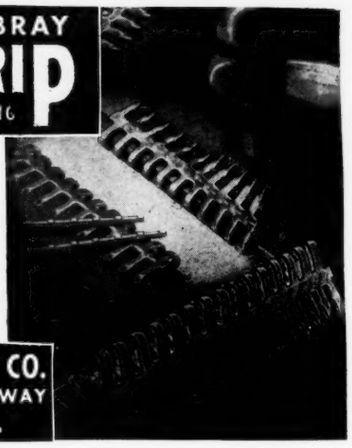
A. WYCKOFF & SON CO.
Office and Factory
No. 35 Home Street, Elmira, N. Y.
The Originators of Machine Made Wood Pipe

HENDRICK
Carbondale **1600**
for
PERFORATED PLATE

Round—Square—Diagonal—Slot
Any perforation

HENDRICK MANUFACTURING CO.
41 DUNDAFF ST., CARBONDALE, PA.
Sales Offices in Principal Cities.
Please Consult Telephone Directory.

ARMSTRONG-BRAY
STEELGRIP
FLEXIBLE BELT LACING



● 8 sizes. Boxed or in long lengths for wide conveyor belts. Easily applied anywhere with a hammer, it compresses belt ends and prevents fraying. 2-piece hinged rocker pin takes up wear. *Immediate delivery.* Write for Catalog showing most complete line of belt lacing manufactured.

ARMSTRONG-BRAY & CO.
5342 NORTHWEST HIGHWAY
CHICAGO, U.S.A.

Clean your coal the RS AND COMPANY *way*

✔ For wet washing use
The IMPROVED LAUNDER-TYPE
HYDRO-SEPARATOR
write for BULLETIN No. 156

✔ For fine coal washing
use **HYDROTATOR**
write for BULLETIN No. 157

✔ For dry cleaning
fine coal 1¼″ x 0″
STUMP AIR-FLOW CLEANER
write for BULLETIN No. 158

ROBERTS and SCHAEFER CO.
307 North Michigan Avenue, Chicago
P. O. Box 865, PITTSBURGH, PA.
P. O. Box 570, HUNTINGTON, W. VA.

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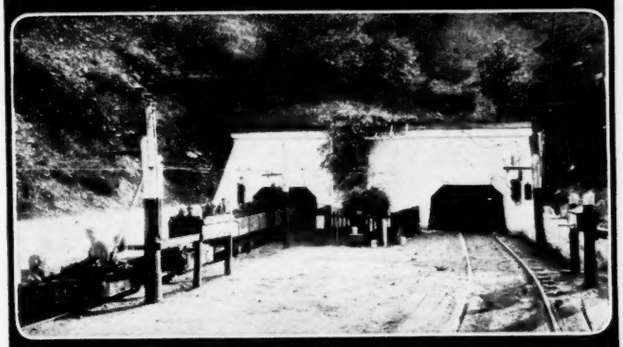
DIRECT MAIL DIVISION
McGraw-Hill Publishing Company, Inc.
330 WEST 42nd ST. NEW YORK, N.Y.

DEMING TURBINES KEEP MINES DRY!



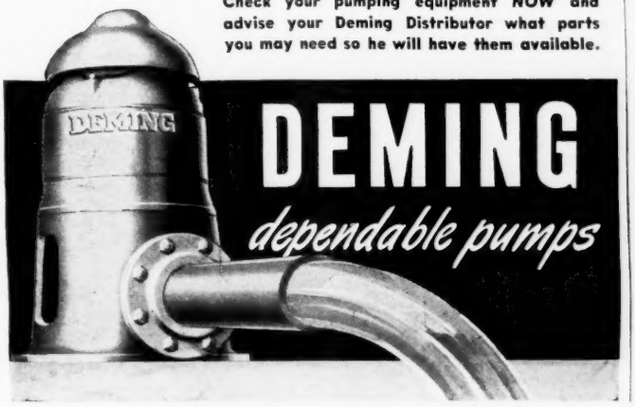
CHECK THESE FEATURES OF DEMING TURBINE PUMPS

1. Semi-enclosed impellers are easily adjustable from top of motor to provide maximum efficiency and low operating cost.
2. Water-lubricated cutless rubber bearings are highly resistant to wear by sand or grit.
3. Easy maintenance of stuffing box which is located in discharge head for quick accessibility.
4. Electrical starting and operating equipment at surface level cannot be flooded out. Pump can be run at night or during off-peak periods, thereby reducing power costs.
5. Ease of installation is due to simplified construction. Pump can be removed at any time for service in other locations.

Do you have a mine dewatering problem? Telephone your nearest Deming representative for prompt engineering service.

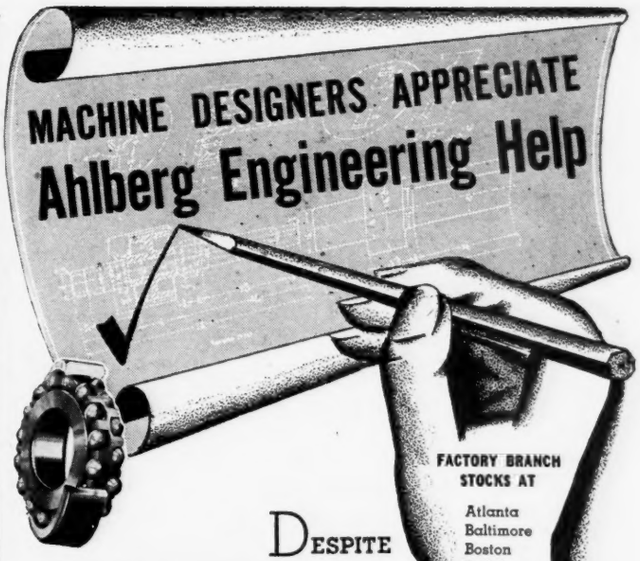
THE DEMING COMPANY • SALEM, OHIO

Check your pumping equipment NOW and advise your Deming Distributor what parts you may need so he will have them available.



DEMING
dependable pumps

MACHINE DESIGNERS APPRECIATE Ahlberg Engineering Help



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DESPITE TODAY'S ABNORMAL CONDITIONS, **AHLBERG ENGINEERING SERVICE** is being maintained as usual. Bearing specialists are available in all twenty-three branches to help you with your immediate bearing problems.

In addition a definite part of Ahlberg Engineering Service is the assistance to bearing users in preparing for alteration of designs and the development of new products with a view to future conditions when new bearings are once again available for normal uses.

IT IS AHLBERG'S DESIRE to make all its facilities available for the needs of peace as well as for the immediate problems of war.

CJB AHLBERG

AHLBERG BEARING COMPANY
Manufacturers of CJB Master Ball Bearings
★ 3089 WEST 47th STREET • CHICAGO, ILL. ★

LINCOLN

Makes a complete line of

LUBRICATING EQUIPMENT AND FITTINGS

Hand-Operated Grease Guns, High-Pressure and Volume Type Bucket Pumps, Lever Guns, Transfer Pumps, Kleenseal and Button Head Fittings—everything for lubricating machinery having bearings requiring grease lubrication. A few of the many items are illustrated here.

Model 5903 Grease Gun. 3-oz. capacity.
Lincoln High-Pressure and Volume Bucket Pumps. 25-lb. capacity.
Model 1101A Grease Gun. 9-oz. capacity.
Lincoln Transfer Pumps. For pumping all types of lubricants, motor oils and other fluids.
Model 5950 Grease Gun. 5-oz. capacity.
Lincoln Button Head Fittings—in all popular sizes.
Model 5957 Grease Gun. 2-oz. capacity.
Lincoln Kleenseal Fittings. Available in all sizes.
Lincoln Lever Guns are available in 16, 17, and 21-ounce capacities.
Lincoln Kleenseal Angle Fittings are available in all popular sizes and angles.

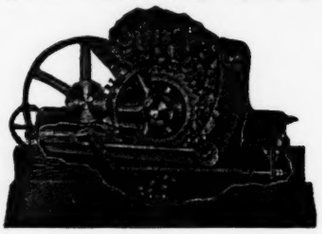
WRITE FOR CATALOG NO. 71

142-9

LINCOLN ENGINEERING COMPANY

Pioneer Builders of Engineered Lubrication Equipment · St. Louis, Mo., U. S. A.

COAL CRUSHERS



We build a type and size for every coal crushing requirement. 100 years of experience is your assurance that we know how. Quotations on request.

McLANAHAN & STONE CORP.

Established 1835 HOLIDAYSBURG, PENNA.

PERFORDATED METAL

COAL MINING SCREENS

Manufactured exactly to your specifications

Any size or style screen, in thickness of steel wanted with any size perforation desired.

We can promptly duplicate your present screens at lowest prices.

CHICAGO PERFORATING CO.
2443 West 24th Place
CHICAGO, ILLINOIS
Canal 1459

Quick ANSWERS to your business problems . . .

MISCELLANEOUS business problems are daily being solved, quickly and easily, by the use of the Searchlight Section of this and other McGraw-Hill publications.

The Searchlight Section is classified advertising: you can use it at small cost, to announce all kinds of business wants of interest to other men in the fields served by these publications. It has long been the accepted meeting place of men with business needs and the men who can fill those needs.

When you want additional employees or a position, want to buy or sell used or surplus new equipment, want products to manufacture, seek new capital or factory sites or have other business wants—advertise them in the Searchlight Section for quick, profitable results!

Departmental Staff

McGRAW-HILL PUBLISHING CO., Inc.

330 West 42nd Street • New York City

SEARCHLIGHT
(Classified Advertising)
SECTIONS are found in these McGRAW-HILL Publications:

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Construction Methods
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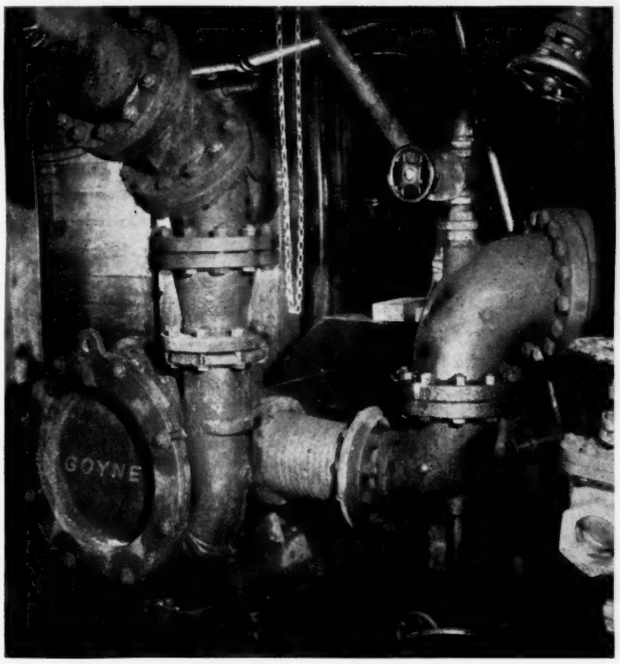
Electrical Merchandising
Electrical World
Electronics
Engineering & Mining Journal
Engineering News-Record
E. & M. J. Markets
Factory Management & Maintenance
Food Industries
Power
Product Engineering
Textile World
Transit Journal

GOYNE PROCESS PUMPS



A Sand Pump is only a link in a chain in a coal washing plant, but it can be a strong link if it embodies the following features as does the Goyne:

1. Ease of inspection of all wearing parts. All internal portions are immediately accessible after removing only the rear head of the pump. No suction or discharge piping is disturbed.

2. The one packing box of the pump is subjected only to suction pressure and is readily kept clean by a low pressure clear water line. Long packing and shaft sleeve life is assured.

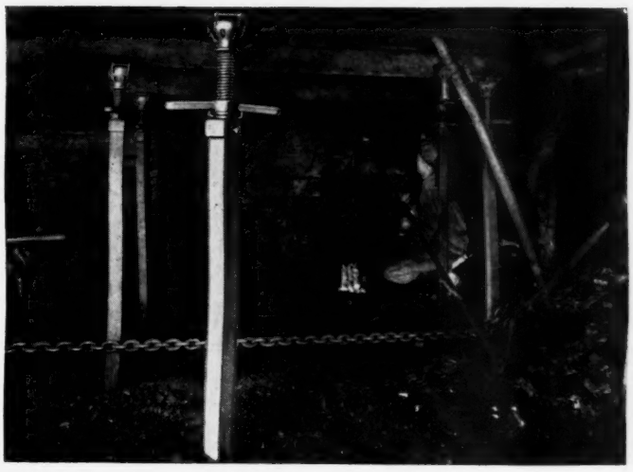
3. Impeller clearance is adjusted *while the pump is running*, insuring constant pump capacity so essential for uniform washing.

4. There are twenty-eight possible nozzle assembly combinations for each standard pump. Washery designers like this "adaptability feature" as it helps them out of tight places and simplifies piping.

5. We carry the spare parts stock. Order your replacements when needed. Reduce your inventory by using Goyne Process Pumps.

All inquiries receive prompt and careful attention.

THE GOYNE STEAM PUMP CO.
ASHLAND, PA.



Uncle Sam Must Have *More Coal* with Greater *Safety!*

All over America smoke belches from tens of thousands of factory chimneys twenty-four hours a day. It tells the grim story of the vital importance of coal. We must have coal in ever-increasing volume for our war effort; and along with stepped-up coal production, we must have additional safety measures.

Simplex Mine Roof Jacks **are doing a great protection job in both manual and mechanized mining. They have many advantages over posts. They are installed quicker, hold faster, take up less room, are stronger, can be placed anywhere and are easier to move. They are more economical too, and they inspire confidence. Rugged, tough, and soundly engineered, you can rely on *Simplex Mine Roof Jacks*.**

Made in two sizes—M-8 for light duty, 8 ton capacity with 1½″ diameter screw and 2″ square tube; and M-16 for heavy duty, 16 ton capacity with 1⅞″ screw and 2½″ square tubing. Heads are made in four types—flat swivel to be used with wooden cap pieces; "V" type for round timbers; "C" type for square and round timbers and large steel beams; and "FF" type for "I" beams and rails.

Simplex Automatic Lowering Jacks **facilitate rapid handling of mechanical equipment in mines, prevent accidents, protect miners and make for maximum tonnage; do lifting, lowering and pushing jobs with maximum efficiency and safety; no chance for load to drop unexpectedly when it is "jacked" down. Toe lift is guaranteed to handle full rated capacity and is concave to grip rails and structural members. Three 5-ton sizes—84-A, 14″ high; 85-A, 17″ high and 86-A, 20″ high for thin, medium and thick seams respectively.**

Write at once for Bulletin Mines-41 for full information on these and on Simplex Mine Timber Jacks, Post Pullers, Simplex Emergency Jacks and Conveyor Hold-Down Jacks, and other jacks for faster, safer shaft or strip mining.

Templeton, Kenly & Co.
Chicago, Illinois
Better, Safer Mine Jacks Since 1899

Simplex Jacks
A better Jack for every job – many jobs for every Jack

SEARCHLIGHT SECTION

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE:

10 cents a word, minimum charge $2.00.

(See ¶ on Box Numbers.)

POSITIONS WANTED (full or part-time salaried employment only), ½ the above rates.

PROPOSALS, 50 cents a line an insertion.

INFORMATION:

BOX NUMBERS in care of any of our New York, Chicago or San Francisco offices count 10 words additional in undisplayed ads.

DISCOUNT of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED—RATE PER INCH:

The advertising rate is $6.30 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page. C.A.

NEW ADVERTISEMENTS received by 10 A. M. June 25th will appear in the July issue, subject to limitations of space available.

POSITIONS VACANT

INDEPENDENT PENNSYLVANIA ANTHRACITE producing company seeks services of individual possessing following qualifications to manage its affairs. Executive ability, mining engineering qualifications, understanding of stripping operations, general operating experience. Liberal remuneration. State Age, experience and full particulars. All replies strictly confidential. P-625, Coal Age, 330 W. 42nd St., New York, N. Y.

EXPERIENCED coal mine cost accountant. Location Southern Illinois. Reply giving full statement. P-629, Coal Age, 520 N. Michigan Ave., Chicago, Ill.

SUPERINTENDENT of large washery, able to take complete charge. Located in Southern Illinois. Reply with full statement. P-630, Coal Age, 520 N. Michigan Ave., Chicago, Ill.

MINE FOREMAN or mechanical production foreman wanted. Reply giving complete experience data to P-631, Coal Age, 520 N. Michigan Ave., Chicago, Ill.

POSITIONS WANTED

CIVIL AND MINING ENGINEER wishes connection with Progressive company, can take full charge of Engineering and Production Departments, 24 years practical experience Anthracite, Bituminous Foreman Certificates, Married, age 44 years. References. PW-619, Coal Age, 330 W. 42nd St., New York, N. Y.

ENGINEER, ATTORNEY—wish executive position with mining company. Experience, 25 years Chief Engineer, Superintendent, mine examinations, reports, construction, shaft sinking, drilling, mechanical loading, conveying, coal washing, coking, power plants, legal, engineering, operating and executive problems, large coal, iron, non-metal plants. PW-622, Coal Age, 520 N. Michigan Ave., Chicago, Ill.

BOARDING HOUSE OPERATOR—with large crew experienced coal miners looking for work anywhere. Address 646 Hegney Place, Bronx, New York.

BUSINESS OPPORTUNITIES

Strip Coal

20 ACRES Pittsburgh seam coal 1½ miles from R.R. Cover averages 15 feet. Very reasonable. BO-616, Coal Age, 330 W. 42nd St., New York, N. Y.

Coal Strip Contract

EXCELLENT COAL STRIPPING arrangement for contractor having shovel or drag line equipment. Long job. No rock. Maximum over-burden 36 feet. Will help finance transportation. Also—second large job for large equipment only. Post Office Box 774, Akron, Ohio.

WE LOOK INTO THE EARTH

By using Diamond Core Drills. We drill for Limestone, Gypsum, Talc, Fire Clay, Coal and all other minerals.

PENNSYLVANIA DRILLING CO.
Drilling Contractors
Pittsburgh, Pa.

DIAMOND CORE DRILLING, for any mineral. More than sixty gasoline, steam and electric drills, suitable for any job. **OUR SPECIALTY—testing bituminous coal lands.** Satisfactory cores guaranteed. Prices very reasonable.

HOFFMAN BROS. DRILLING CO.
PUNXSUTAWNEY, PA. Est. 1902 Tel. 332

BUSINESS OPPORTUNITIES

Rail-River Coal Mines

In midwest available on lease basis. Address BO-628, Coal Age, 520 N. Michigan Ave., Chicago, Ill.

FOR LEASE

FOR LEASE: 3200 acres 6 foot ±5 coal for underground Mining and 2800 acres strip coal 4 foot 2 inches ±5 seam. Plenty of water available. New York Central railway and Southern Indiana Gas & Electric Company power line on these lands. We deal with operators only. J. R. Wasson, Boonville, Indiana.

FOR SALE

JOY LOADER, Bradford Breaker Outfit. Four 12 Cubic Yard Sidedump Railroad Cars, Two Skips or Cages, Hoisting Engines, Steel Headframe with Sheaves. FS-627, Coal Age.

WANTED

WANTED to buy cash, one used Mine Locomotive, 15 or 18 Ton, not over 30" high, 250 Volt D. C., for 42" or 44" gauge, in good condition. W-626, Coal Age, 520 N. Michigan Ave., Chicago, Ill.

FOR SALE

1200 acres, Coal in Buchanan County, Virginia. Two miles frontage on Norfolk and Western Railway. 3 seams, 40-50 and 75' high respectively. Priced so that it can be held as an investment if desired.

J. G. & GEORGE BUSTON, OWNERS
TAZEWELL VIRGINIA

Stripping Equipment

5 Large Draglines, 175' booms, capacity million yards per month.

For Rent, Sale, Contract or Development of property

FS-612, Coal Age
520 No. Michigan Ave., Chicago, Ill.

FOR SALE

STEEL TIPPLE

Three track Roberts and Schaffer steel tipple with Marcus shaker screen and loading boom, 150 to 200 ton capacity.

Write **FS-624,** Coal Age
330 W. 42nd Street, New York, N. Y.

WANTED

-TRANSFORMERS-

TRANSFORMERS WANTED

in operating condition or burnt out. Mail us list giving complete nameplate data and stating condition.

We Rewind, Repair and Redesign all Makes and Sizes
ALL TRANSFORMERS GUARANTEED FOR ONE YEAR
Write for Catalog No. 136-B

THE ELECTRIC SERVICE CO., INC.
"AMERICA'S USED TRANSFORMER CLEARING HOUSE"
STATION M Since 1912 CINCINNATI, OHIO

WANT TO BUY:

1—Jeffrey L-400 Loading Machine
1—Jeffrey 29-U Cutting Machine

FOR SALE:

3—Sullivan CE-7 Shortwalls
2—Jeffrey A-6 Post Drills

BATON COAL CO.
1100 Union Trust Bldg.
PITTSBURGH, PENNSYLVANIA

WANT TO BUY

1 to 6 **Tyler or Hummer Vibrating Screens.**
1—30x30 or 2 smaller roll type **Coal Crushers.**
1—200 to 300 KW **M.G. Set.**
1—50 to 60 Ton **Locomotive.**
20 Ton or Larger **Locomotive Crane.**
1—**Rotary Dryer** 5x60 or equal.
2—1300' or equal **air compressors.**

RUSSELL STANHOPE
60 East 42nd Street New York ,N. Y.

NEW "SEARCHLIGHT" ADVERTISEMENTS

received by June 25th, will appear in the July issue, subject to limitations of space available.

Address copy to the Departmental Staff

COAL AGE
330 West 42d St., New York City

REBUILT EQUIPMENT—READY TO SHIP

MINING MACHINES
CE-6 Sullivan 250 v. DC.
CE-7 Sullivan Shortwall 250 v. 6' bar
CE-7 Sullivan Shortwall A.C. 220/440

MINE LOCOMOTIVES
4½ ton West. 250 v. 36/42" ga.
6 ton Atlas 220 v. 3 ph. 60 cy. 36" ga.
10 ton Milwaukee GASOLINE

ROTARY CONVERTERS
2—500 kw. G.E., type HC-8, 600 volt, 900 rpm. complete with transformers and switchboards.
150 kw. West. 250 v. 1200 rpm 2200/3/60.
150 kw. G.E. HCC 250 v. 1200 rpm. 440/3/60.

TRANSFORMERS
3—10 kva. Pgh. 2200-220/110/1/60
3—20 kva. G.E. 2200 v. 220/110-1/60
3—37½ kva. West. 22000-2200/1/60
1—50 kva. Burke 2200-110/3/60
2—75 kva. Burke 2200-110/3/60
1—100 kva. West. 2200-220/110v.1/60
3—500 kva. West. 22000-2200/1/60
3—833 kva. West 22000-2200/1/60

SPEED REDUCERS
Thomas, 3 HP ratio 100:1
Cleveland 600 AT 10 HP. ratio 90:1

M.G. SETS
50 kw. Allis Chal. 250 V. D.C. 1200 rpm., 220/440 v. 3 ph. 60 cy. Syn.
125 kw. Crocker Wheeler 250 v. D.C. 220/440 v. 3 ph. 60 cy. Ind.
200 kw. Westinghouse 600 v. 600 rpm., 2200 v., 3 ph., 60 cy. Syn.
500 kw. Westinghouse 600 v. 514 rpm. 2200 v., 3 ph., 60 cy. Syn.

SHAKER SCREEN
La Del Shaker Screen 62¼" wide, 8' long.

LOADING MACHINE
1—Jeffrey 44 E.E. open type 250 v. DC 42" ga.

HOISTS
25 HP. Thomas 18" face 20" dia.
40 H.P. single drum AC 220/3/60.
100 H.P. Lidgerwood 2 drum AC or DC Motor

SLIP RING MOTORS
3 ph. 60 cy.

HP.	Make	Speed	Type
700	G.E.	393	MT-432
400	West.	1170	CW
300	G.E.	600	IM
260	Burke	600	EM-65
200	West.	690	CW-956A
100	West.	1750	

230 V. D.C. MOTORS

HP.	Make	Speed
125	G.E.	1750 rpm.
100	West.	250
85	G.E.	530
75	West.	1700 rpm.
75	West.	475
75	Reliance	1750
50	West.	975 rpm.
50	West.	1700 rpm.

SERIES MOTORS—230 V. D.C.
3— 50 HP. West. 38-B 500 rpm
5— 75 HP. G.E. 550 rpm
1—135 HP. G.E. MDS-109 460 rpm.

DC GENERATORS—250 Volt
80 kw. West 265 rpm.
100 kw. G.E. 550 rpm.

A.C. GENERATOR—3 ph. 60 cy.
219 kva G.E. 2200/440/220 v. 200 rpm.

A. C. Motors—3 ph. 60 cy.

HP.	Volts	Make	Type	Speed
150	220/440	West.	CS	1800
150	2300	West.	Syn.	900
200	2200/440/220	West.	CS	250
200	2200	G.E.	IK-15	1200
200	220/440	West.	CS	1200
200	220/440	West.	Cs	720
200	220/440	West.	CS	600
225	2200	West.	CS	900
250	220/440	West.	CS	900
250	2200	West.	CS	1200
275	2200	West.	CS	1800
300	220/440	West.	CS	1150
300	2300	West.	CS	1200
300	2200/440/220	West.	CS	450
350	2200/440/220	West.	CS	450
400	2200/440/220	West.	CS	500
450	2200/440/220	West.	CS	600
500	2200/440/220	West.	CS	720
600	2200/440/220	West.	CS	900

CENTRIFUGAL PUMPS
4x3 Harris, 320 rpm.
4x4 Weinman, 500 gpm.
6x6 Gould, bronze, 1300 gpm.
8x8 Weinman, bronze.
5x6 Hayton, 750 gpm.
6x6 Manistee, 750 gpm.
6x6 American, 1000 gpm., bronze.
6x6 Weinman, 1000 gpm.

ENGINE GENERATOR SETS
50 kw. 250 V. D.C. Generator direct connected to International Diesel Engine.
50 kw. West. 220/3/60 Ames STEAM.
75 kw. G.E. 220/3/60 Bessemer GAS.
80 kw. West. 250 V. Belted 110 Bessemer GAS.
175 kw. G.E. 2200/3/60 Ridgway STEAM.
175 kw. West. 2200/3/60 Skinner STEAM.
225 kw. Elec. Machy. 2300/3/60 Ideal STEAM.

TURBINE
1—Kerr Steam Turbine 450 BHP 3800 rpm., 5" intake 12" exhaust with Kerr Reduction Unit 3800 to 720 rpm., 115# pressure.

DUQUESNE ELECTRIC & MFG. CO. . . . . PITTSBURGH, PA.

MINE EQUIPMENT
FOR SALE

Locomotives—Mining Machines
Pumps—Motors—Transformers
Steel Tipples — Rescreeners
Steam Hoists—Electric Hoists
Compressors — Loading Booms
Engines — Generators — Scales
Miscellaneous Mine Equipment

Our own modern machine shop is available to repair and modernize your equipment.

Complete Mines dismantled and sold.

HAIR EQUIPMENT COMPANY
Office and Warehouse
Reed and Election Streets
BENTON, ILLINOIS

RAILS—CARS
All sections of rails and good serviceable second hand cars, all gauges, also spikes, bolts, frogs, switches and ties

M. K. FRANK
480 Lexington Ave. New York City
450 Fourth Ave. Pittsburgh, Pa.

RAILS and ACCESSORIES
RELAYING RAILS—Super-quality machine-reconditioned—not ordinary Relayers.
NEW RAILS, Angle and Splice Bars, Bolts, Nuts, Spikes, Frogs, Switches, Tie Plates, and all other Track Accessories.
Phone, Write or Wire
L. B. FOSTER COMPANY, Inc.
PITTSBURGH NEW YORK CHICAGO

MOTOR GEN. SET
300 KW, 600 Volt, 900 rpm, Westinghouse to a 450 HP, 3 phase, 60 cycle, 80% P.F. Westinghouse Synchronous motor with A.C. & D.C. panels.

GEORGE SACHSENMAIER CO.
Holmesburg, Philadelphia, Pa.

MINE HOISTS
1—Thomas 24" Drum, with 50 HP electrical equipment.
1—Vulcan 30" Band Friction with 50 HP electrical equipment.
1—Flory 48" Band Friction with 150 HP electrical equipment.
1—Connellsville 54" Drum Haulage Hoist with 100 HP electrical equipment.
1—Lidgerwood 54" Drum with 150 HP electrical equipment.
1—Lidgerwood Haulage Hoist 60" drum 6000 ft. 1⅛" rope, 300 HP electrical equipment.
1—Vulcan Cylinder Conical Drum Shaft Hoist, 350 ft. 1⅜" rope with 400 HP motor and control.
1—Nordberg Cylindro-conical Shaft 400 ft. 1½" rope with 600 HP motor and control.

And other hoists to suit all mining conditions

Jones Mining Equipment Co.
541 Wood Street Pittsburgh, Pa.

WE BUY AND SELL
MOTORS
TRANSFORMERS
MOTOR GEN. SETS
OIL SWITCHES
AIR CIRCUIT BREAKERS

ELECTRIC EQUIPMENT CO.
347 N. Clinton Ave., Rochester, N.Y. Tel: Main 252

ROTARY CONVERTERS
500 KW WEST. SYN. 275 V., 6 Ph., 60 Cy., 1200 RPM, Pedestal type, 2300/4000 V. Transformers.
300 KW G.E. SYN. 575 V. HCC, 6 Ph., 60 Cy., 1200 RPM, form P, 2300/4000 V. Transformers.
200 KW G.E. SYN. 275 V. HCC, 6 Ph. 60 Cy., 1200 RPM, form P, 2300/4000 V. Transformers.
200 KW AL-CH SYN. 275 V. 6 Ph., 60 Cy., 1200 RPM, Pedestal Type, 2300/4000 V. Transformers.
150 KW R.W. SYN. 275 V., 6 Ph., 60 Cy., 1200 RPM, Pedestal type, 440/2300/4000 V. Trans.

MOTOR GENERATORS
300 KW G.E. IND., 275 V., 440 V., 3 Ph., 60 Cy., 720 RPM, Manual Switchgear.
200 KW G.E. IND., 275 V., 440 V., 3 Ph., 60 Cy., 720 RPM, Manual Switchgear.
200 KW G.E. SYN., 275 V., 2300/4000 V., 3 Ph., 60 Cy., 80% P.F., 1200 RPM, Manual Switchgear
200 KW G.E. SYN., 275 V., 2300 V., 3 Ph., 60 Cy., 100% P.F., 720 RPM, Manual Switchgear.
100 KW WEST. SYN. 275 V., 2300 V., 3 Ph., 60 Cy., 100% P.F., 900 RPM. Manual Switchgear.

LOCOMOTIVES
13-T JEFFREY, 250 V., MH-110 Mts., 44"-36" Ga.
10-Ton GOODMAN, 250 V., 29-A Mts., 36" Ga.
10-Ton GOODMAN, 500 V., 36-B Mts., 42" Ga.
8-Ton WESTGHE, 250 V., 906 Mts., 48"-36" Ga.
6-Ton WESTGHE, 250 V., 904-C Mts., 42"-36" Ga.
5-Ton WESTGHE, 250 V., 902-B Mts., 56½" Ga.
4-Ton WESTGHE, 250 V., 902-C Mts., 36" Ga.
4-Ton GOODMAN, 250 V., 42-I Mts., 44" Ga.

Each unit listed above is owned by us and is available now for immediate purchase.

WALLACE E. KIRK COMPANY
Incorporated
501 Grant Building Pittsburgh, Pa.

FOR SALE
1—200 KW Westg. Syn. Motor Generator Set 600 V. D.C., Gen., connected to 290 H.P. Synch. motor 3/60/2200 and 900 RPM, with exciters and controls.
4—50 H.P. G.E. unused slip ring Type MTC Hoist & Crane Motors, 3/60/440 with new controls.

IRON & STEEL PRODUCTS, INC.
13484 So. Brainard Ave., Chicago, Illinois.
"*Anything* containing IRON or STEEL"

6 YD. STRIPPER SHOVEL

200-B Bucyrus 6 years old. 75 ft. Boom, 60 ft. Dipper stick, 6 yd. Dipper Steam Shovel.

SHOVEL & DRAGLINE:
4 yd. 120 B Bucyrus Electric Shovel & 100 ft. boom Dragline
2½ yd. 100 B Elec. Shovel.

DIESEL DRAGLINES

3W 4W & 5W Monighan Walkers, 90 to 110 ft. booms.
3 Yd. P.&H. 900, 97′ boom.
2½ Yd. 48B Bucyrus 80′ boom.
2 Yd. 750 Lima, 60′ boom.

AIR COMPRESSORS:
(7) Steam 66 ft., 300 ft., 600, 1000 & 1940 ft.
(12") Belted, 360, 676, 870, 1000, 1300 ft.
(12) Diesel 105, 315, 520, 676 & 1000 ft.
(6) Electric, 1300, 1500, 2200, 2600, 5000 ft.
(14) Gasoline, 110, 160, 220, 310 & 370 ft.

COAL CRUSHERS:
Jeffrey Single Roll 18x18, 24x24 & 30x30
Link Belt 26x24 Double Roll Crusher

HYDRAULIC CARWHEEL PRESSES:
100 Ton, 150 Ton, 300 Ton, 300 & 400 Ton Caldwell - Niles - Wood - Watson Stillman

RUBBER CONVEYOR BELTS:
1000′ 60", 600′ 30", 300′ 20", 1600′ 42", 900′ 48", 1450′ 36", 1200′ 24", 900′ 18", 600′ 16", 350′ 14".

CONVEYOR PARTS:
Idlers, Head & Tail Pulleys, Steel Frames, Tripper, etc., 14 In., 60 In. Large Stock here.

SYNC. MOTOR GENERATORS & ROTARYS:
100 KW Ridgway 1200 RPM 3/60/2300/250-275
150 KW G.E. 1200 RPM 3/60/2200-250-275
200 KW Ridgway 900 RPM 3/60/2200-250-275
3—100 KW G.E. 275 v. 1200 RPM Rotarys

STORAGE BATTERY LOCOMOTIVES:
2½ ton Whitcomb 24 ga. New Batteries
2—4 ton G.E. 30 in. ga.
3—5 ton Mancha 30 in. ga.
4—8 ton G.E. 36 in. ga.
3—7 ton Goodman 36 ga. Battery & Trolley
8—6 ton Baldwin Westgh. 42 ga. & 36 ga.

TROLLEY LOCOMOTIVES:
2½ ton Westinghouse 24 ga.
4—6 ton & 3—5 ton Goodman 36 ga.
3—6 ton Goodman 30 ga.
4—6 ton Goodman 42 ga.
5—6 ton Westinghouse 42 ga.
2—8 ton Goodman 36 ga.
10 ton Goodman 42 ga. & 13 ton Jeffrey

VIBRATING SCREENS:
9 Tyler Hummer 3x6, 4x5, 4x8 & 4x10
2 Robins Gyrex 4x8½
4x12 Niagara, 3x8 L. B., 5x6 Simplex

CARS:
120—4 ton 42 ga. S.D. Mine Cars
60—Western 16-20-30 yd. Side Dump

SHOVELS, CRANES & DRAGLINES:
3 W 90′ Boom, 6 W 160′ Boom, Model 6150, 175′ Boom, Diesel, Monighan Walkers
1 yd. K 30 Link Belt 50′ Boom Crane
2 yd. Page 70′ Boom Diesel Dragline
1¼ yd. Marion 450 Elec. Shovel
1½ yd. Lima Diesel Shovel & Dragline
2 yd. Link Belt Elec. Shovel & Dragline
25 ton Browning 50′ Boom Loco. Crane
7 Conway 20A, 30A, 50A, 60 & 75 Muckers

MINE LOADERS:
Junior Joy 36 ga. Low Pan
Conway 20 Mucker
3—5 BU & 7 BU 36 or 42 ga. Joy
9—Goodman 260 & Jeffrey 44L

MISCELLANEOUS
5′x160′ Traylor Rotary Dryer
100 HP G.E. 3/60/440 v.-900 RPM Elec. Motor
6 Goodman 12CA & 12 DA 6 ft. Cutters
9x8 Sullivan Mine Compressors
Clamshell Buckets ¾, 1, 1½ & 2 yd. Cap.
30 ton & 12 ton Vulcan Std. Ga. Gas. Loco.

WANTED TO BUY:
Complete Mines—M.G. Sets, Locomotives, Compressors, Conveyors, Cranes, Crushers & Rotary Converters. Also Rails, Screens, Pumps, Cars, Mine Loaders & Mining Machines.

Tidewater Equip. & Machy. Corp.
305 Madison Ave New York, N. Y.

FOR SALE

LOCOMOTIVES

15—6-ton Gathering Locomotives, G. E., Jeffrey and Goodman.
7—8-ton Locomotives, G. E., Westinghouse and Jeffrey.
5—10-ton Locomotives, General Electric, Goodman and Jeffrey.
4—15-ton Locomotives, Westinghouse, General Electric and Jeffrey.

The above locomotives are completely rebuilt—36" to 48" gauge.

ROTARY CONVERTERS

2—300 KW G. E. Synchronous Rotary Converters, type HCC-6, form P, 1200 RPM, 250/275 volt DC, switchboards and all necessary switchgear, including 2300 volt transformers.

BELT CONVEYORS

1—Goodman type 97-30, 30" Belt Conveyor, 1000′ centers, 121 intermediate sections.
1—Goodman type 97-30, 30" belt conveyor, 959′ centers, 117 intermediate sections. Practically new.

LOADING MACHINES

15—5-BU Joy Loading Machines. Perfect operating condition.
15—G-20 Goodman Automatic Duck Bills. Practically new.

MINING MACHINES

25—Sullivan CE-7 AC, 220/440 volt. Just taken out of service. Excellent condition.

SEVERAL SHAFT AND SLOPE HOISTS

From 300 to 1300 H.P.

Frank J. Wolfe

We Specialize in Buying Complete Mines That Are Going Out of Business or From Receivers in Bankruptcy, Administrators of Estates, Etc.

OUR FINANCIAL RESPONSIBILITY IS YOUR GUARANTEE OF SATISFACTION!

COAL MINE EQUIPMENT SALES COMPANY
306-7 Beasley Building L. D. Phone 34 Terre Haute, Indiana

FOR SALE

1—Heyl-Patterson Coal Bridge or Gantry 2½ Ton with bucket. 5 Ton without. 200′ span — 57′ height— 230 V. DC

3—133 HP Sterling Boilers
5—250 HP Sterling Boilers
1—300 K.W. Turbo Generator Set. 230 V. DC

HETZ CONSTRUCTION CO.
WARREN, OHIO Phone: 4474

PIPE—MACHINERY—GAS ENGINES
AIR COMPRESSORS—DIESELS—PUMPS

Some Steam Engines and Boilers available only slightly above the metal price

BRADFORD SUPPLY COMPANY
WAYNE, WOOD COUNTY, OHIO Near Toledo

IRON and STEEL PIPE
New and Used
Large stocks, all sizes attractive prices
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P. O. Box 1647 Pittsburgh, Pa.

New and Guaranteed Tested Reconditioned
STEEL PIPE AND BOILER TUBES
In Light Weight, Standard or Heavy
Jos. Greenspon's Son Pipe Corp.
NAT'L STOCK YDS (ST CLAIR CO) ILL.

NEW and REBUILT
STORAGE BATTERY
LOCOMOTIVES
1½ to 10 Ton—18" to 56" Track Gauge
GREENSBURG MACHINE CO.
Greensburg, Penna.

FOR SALE AT SPECIAL PRICE
100,000 ft. 2" used first quality Lapweld pipe with recessed couplings.
WRITE WIRE PHONE
INTERSTATE PIPE & SUPPLY CO.
Marietta, Ohio

STEEL PAN CONVEYOR
90 foot centers four feet wide Jeffrey Good condition with 40 H.P. A.C. 440 V motor.
CENTRAL WEST COAL CO.
EDWARDS, ILL.

High Grade Maintenance Machine Tools
Lathes, Shapers, Milling Machines. Hydraulic Presses, Hack saws, every type of tool for the maintenance shop. Write for catalogue.
Cincinnati Machinery & Supply Co.
217 E. Second St. Cincinnati, Ohio

NEED DUMP CARS?
IMMEDIATE DELIVERY
16, 24-yd. Koppel 24, 16-yd. Western
4, 20-yd. Koppel 10, 16-yd. Kilbourne & Jacobs
3, 20-yd. Western 62, 12-yd. Western
Illustrated specifications available
OTHER TYPES OF CARS TOO
Also Locomotives, Cranes, Shovels, Etc.
IRON & STEEL PRODUCTS, INC.
13484 S. Brainard Ave. Chicago, Illinois
"ANYTHING containing IRON or STEEL"

FOR SALE
500 KW—550 Volt—D.C. General Electric Motor Generator Set.
500 Volt Mine Locomotives—5 to 18 Ton
D.C. Crane Motor, Direct Connected.
Thomas Single Drum Hoist—50 HP—250 Volt—
Jeffrey Bucket Elevator—30′ High.
Cheap for quick sale!
IRONTON PRODUCTS COMPANY
Ironton, Ohio

Desirable Electric Equipment—Prompt Shipment From Our Warehouse

750 KW TURBINE
Westinghouse Mixed Pressure 110# H.P.
2 to 4# LP 3600 RPM with gear box to 900 RPM, with accessories.
(Formerly con. to 750 KW 250 v. 900 RPM Gen.)

SYN. MOTORS 3 ph. 60 cy.

HP	Make	V.	Speed
350	Al. Ch.	2200	600
225	Ideal	440	900
2— 75	Westgh.	2200	900
75	Westgh.	220	1800

M-G SETS 3 ph. 60 cy. (Syn.)
150 KW West. 550 v. DC 2200 v. AC—1200 RPM
150 KW Ridgway 250 V.—2300 V. AC 900 RPM
100 KW Cr. Wh. 2502 DC—440/3/60 1200 RPM.
100 KW Westgh 250 v.—DC 2200 v. AC 1200 RPM.
50 KW Al. Ch. 2502 DC—440/3/60—1200 RPM.
90 KW Al. Ch. 250 v. 2200 v. AC 900 RPM

LOCOMOTIVES
5 Ton Jeffrey Storage Battery 42 to 44" Ga. 2 BB motors, Battery box on top.
6 Ton Whitcomb 250 v. 40" Ga.
10 Ton West. 250 v. 42" Ga. Mining Machines:

AIR COMPRESSORS
846 cu. ft. 65# Ing. Rand 2 stage ERI
550 cu. ft. 100# Bury 2 stage
160 cu. ft. Chic. Pneu. 100#
Sullivan Port. Mine Comp. 10 x 10—42" Ga.

MINING MACHINES
2—CE 7 Sullivan DC standard 30 HP
12—G3 Goodman Std. Truck 220/3/60 6' bar.

SLIP RING & SQ. CG. MOTORS (3 ph. 60 cy.)

HP	Make	Speed	Wdg.	Type
700	G.E.	393	S.R.	MT 432
450	G.E.	257	S.R.	MT
400	West.	500	S.C.	CS
300	G.E.	600	S.R.	IM
200	Cr. Wh.	440	S.R.	28
200	Al. Ch.	600	S.C.	
125	Al. Ch.	435	S.R.	
125	Burke	1200	S.C.	
100	F.M.	600	S.C.	BB
100	Burke	900	S.C.	
100	GE	500	S.R.	MI-25 cy.
75	West.	870	S.R.	CW752C
75	West.	575	S.R.	CW868A
75	G.E.	865	S.C.	KT

HOISTS
75 HP Ottumwas sgl. fr. drum 36" Dia. 30" wide 8" flanges geared 75 HP CI Westgh. slip ring motor with rev. drum control
75 HP Lidgerwood sgl fr. drum
50 HP Diamond 2 drums same Shaft
30 HP Clyde sgl. drum AC Motor
25 HP Thomas sgl. drum AC Motor
15 HP Lidgerwood sgl. dr. AC Motor

400 TRANSFORMERS (Westgh. & GE 1 ph.)

Qu.	KVA	Pri. V.	Sec. V
3	1	2080/2200	115/230
5	2	"	"
9	3	"	"
100	5	"	"
137	7½	"	"
71	10	"	"
10	15	"	"
25	25	"	"
1	30	"	"
3	37 Rotary	4400/185	"
6	50	2080/2200	"
2	100	"	"
3	110 Rotary	2100/185 3 Phase	
1	5	2080/2200	115/230
2	50	"	"
1	150	"	230/460

ENGINE GENERATOR SETS
100 KW 250 v. DC Westgh.—Skinner Engine

DC MOTORS (230 Volts)

HP	Make	Speed	Type
40	GE	700	
30	West.	600	S-9
20	West.	900	SK-100L
25	West.	600	SK 130
20	West.	750	SK 110L

MOORHEAD-REITMEYER CO., INC.
PITTSBURGH, PENNSYLVANIA

Immediate Shipment
Low Prices

NEW RUBBER

Guaranteed
High Grade

CONVEYOR and TRANSMISSION BELTING

CONVEYOR BELTING
ABRASIVE RESISTANT COVERS

Width	Ply	Top-Bottom	Covers
48"	8	1/8"	1/16"
42"	5	1/8"	1/16"
36"	6	1/8"	1/16"
30"	6	1/8"	1/16"
30"	5	1/8"	1/16"
24"	5	1/8"	1/32"
24"	4	1/8"	1/32"
20"	5	1/8"	1/32"
20"	4	1/8"	1/32"
18"	4	1/8"	1/32"
16"	4	1/8"	1/32"
14"	4	1/16"	1/32"
12"	4	1/16"	1/32"

TRANSMISSION BELTING
HEAVY-DUTY FRICTION SURFACE

Width	Ply	Width	Ply	Width	Ply
18"	6	10"	6	6"	5
16"	6	10"	5	5"	5
14"	6	8"	6	4"	5
12"	6	8"	5	4"	4
12"	5	6"	6	3"	4

ELEVATOR BELTING
HEAVY DUTY RUBBER COVERED

Width	Ply	Top-Bottom	Covers
12"	6	1/16"	1/16"
14"	6	1/16"	1/16"
16"	6	1/16"	1/16"
18"	6	1/16"	1/16"

ENDLESS "V" BELTS
"A" — WIDTH — All Sizes
"B" — WIDTH — All Sizes
"C" — WIDTH — All Sizes
"D" — WIDTH — All Sizes
"E" — WIDTH — All Sizes
Sold in Matched Sets

RUBBER HOSE
ALL SIZES FOR AIR — WATER — STEAM — SUCTION — FIRE — WELDING ETC.

Inquire For Prices :—: Mention Size and Lengths

CARLYLE RUBBER CO., Inc.
66 PARK PLACE New York, N. Y.

SUB STATIONS
1—300 KW G. E. Syn. MG Set, 275 V DC.
1—200 KW G. E. Syn. MG Set, 275 V DC 1200 RPM.
1—200 KW West. Rotary Converter, 275 V DC with 2300 V Transformers.
1—150 KW West. Syn. MG Set, 275 V DC.
1—35 KW 125 V Battery Charging Set.

MINE LOCOMOTIVES
2—8 ton Jeffrey MH 100 250 V Motors.
2—8 ton Westinghouse Bar Steel Frame, 906 Motors.
1—6 ton Jeffrey MH 88 250 volt motors.
2—5 ton G. E. HM 825 motors Gathering.

CUTTING MACHINES
12—35B Jeffrey 250 V Shortwall
1—35BB Jeffrey AC Shortwall.
1—12G3 Goodman AC Shortwall.
2—12AB Goodman 210 V DC Shortwall.
1—29B Jeffrey Arcwall DC
1—29C Jeffrey Arcwall DC

MOTORS
1—600 HP West. Type CW Slip Ring, 3/60/2300/435 RPM
1—150 HP G. E. 3/60/2300/600 RPM.

MISCELLANEOUS
2—Goodman duck bill Conveyor Loader 90L Elevating Conveyor.
70—Drop Bottom Mine Cars.

TIPPINS MACHINERY COMPANY
3530 Forbes St. Pittsburgh, Penna.

LINK-BELT UNLOADING TOWER

SUITABLE FOR COAL OR ORE

GANTRY TYPE • CAPACITY 750 T.P.H.
RAIL SPAN 44' • OVERALL HEIGHT 114' WIDTH 166'
COMPLETE WITH WIRING AND 8 SELF-CONTAINED 3 PHASE MOTORS AND BUCKET

ERMAN-HOWELL & CO., INC.
332 S. MICHIGAN AVE. *CHICAGO, ILL.*

★IMMEDIATE SHIPMENT★

LOCOMOTIVES
1—6-ton Ironton with G.E. Reel, 44' GA, 250 volt, 26" high.
1—4-ton Jeffrey MH 121, with motor driven Reel, 250 volt 44' GA, 26" high.
1—10-ton West. 500 volt, 44" GA

CUTTING MACHINES
All 250 Volt
1—224-AA low vein Goodman Slabber
1—12-AA Goodman Shortwall
1—12-A Goodman Shortwall
1—12-G3 Goodman Shortwall —220 volt A. C.
8—C E-7 Sullivans
1—C E-10 Sullivans
1—C R-2 Sullivan—Low vein
1—C E-7 Sullivan—220 Volt A C

LOADING MACHINES
1—8 B U Joy 250 volt
1—8 B U Joy 500 Volt

SUBSTATIONS
1—150-KW MG Set 275 Volt
1—150-KW MG Set 500 Volt

MISCELLANEOUS
50-H P Diamond Hoist Complete
100-H P Slip Ring Motor, 2200 Volt, 580 R.P.M.
280-H P—G E Sync. Motor, 2300 Volt, 600 R.P.M.
15-ton Bridge Crane, 50' Span A. C. and D. C. Motors

LET US KNOW YOUR NEEDS—WE BUY, SELL, AND TRADE

ALL-STATE EQUIPMENT CO., Inc.
LOGAN, WEST VIRGINIA

IMMEDIATE DELIVERY

10—JOY 5 BU LOADING MACHINES, 250 volt, 42" gauge 52" height, 35 H.P. motors; all in first class operating condition, can be seen in operation in Central Illinois, loading large tonnage. IMMEDIATE DELIVERY.

MINING MACHINERY SALES CORP.

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BUY FROM A CONCERN BOTH FINANCIALLY AND MORALLY RESPONSIBLE

LOCOMOTIVES

Goodman: All 250 volts.
1—10 ton, 31-1-4-T
1—6 ton, 30B, 48" 1—5 ton.
1—5 ton, W-I-2, 36"
Westinghouse: All 250 volt.
1—4 ton, 902, 48" 1—15 ton, 102, 44"
1—904 c. 44" 500 volt. Also 906 motors.
1—10 ton, 915
G.E.: All 250 volt, 5 ton 825, 44"
6 ton 803, 44", as is 4 ton 1022, 44, as is
6 ton 823, 44" 8 ton 839, motors.

Jeffrey: 6 ton, and 4 ton, all gauges, 250 volt.

MINE FANS—Aluminum

36"—48" and 60" with adjustable pitch blades. 4 P to 84000 C.F.M. Free air.

MINING MACHINES

Jeffrey, 35B, 29B, and 4—28A 250 V. 2—29C with drop bar support.
Goodman, 12A, 12AB, 12AA, 12G3A, 124EJ.
1—12G3 250 volt and 2—112 DA, 500 volt.
2—Permissible Type 12CA.

Sullivan, CE7, CE9, CE10, CR10 Low Vein 1 Class 5 Buddy and Shearing Machine. AC and DC.

SUBSTATIONS—275 volts, D.C.

2—200 KW **West.** Converters.
2—200 KW **Ridgeway** Converters.
1—150 KW **G.E.** Rotary.
1—150 KW **West.** Rotary.
2—150 KW, 2—100 K **Ridgeway** M-G Sets.
1—150 KW **West.** M-G Sets.
1—200 KW **G.E.** Rotary Converter.

AERIAL TRAMWAYS * HOISTS * PUMPS * MOTORS * TRANSFORMERS * BOND WELDERS * RESISTANCE. COMPRESSORS * CAR RETARDERS * DUMPS SPEED REDUCERS * FIELD FRAMES * ARMATURES * GOODMAN HYDRAULIC SHOVEL * MOTOR STARTERS AND CONTROLLERS—AC & DC * DROP BAR SUPPORTS (Gooseneck), 29B and 29C * MINING MACHINE TRUCKS * SWITCHBOARDS * CIRCUIT BREAKERS—AC & DC * CONVEYOR HOISTS COAL CRUSHERS, double roll 12"x16" single roll 24"x24" and 18"x16" * Sullivan BIT SHARPENER * TURBO-GENERATOR 500 K.W. 275 volt DC * ROPE & BUTTON CONVEYOR 400' long * LATHES, SHAPERS * LINK BELT * ELECTRIC SLATE DUMP * 2 SIRENS A.C.

GUYAN MACHINERY COMPANY, Logan, W. Va.

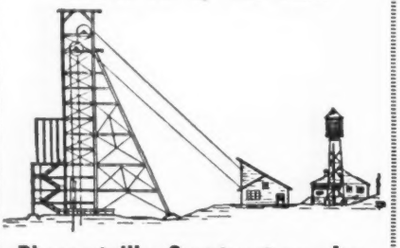
2 VULCAN MINE HOISTS

2 Yrs. old—9' P.D. Single Drum
6'0" and 7'8" Face
350 HP and 500 HP
400 FPM and 600 FPM

STEEL HEADFRAMES

140' high—4 Post with Back Brace
Total weight approx. 200 Tons
Designed for 1¼" dia. Rope,
146 ton Breaking Strength
5'10" x 13'6" Cage—
5'0" x 5'0" Skip.
Each 15 ton Capacity.

5 Sheaves 9' P.D.
Grooved for 1¼" dia. Cable



Pleasantville Constructors, Inc.
Chelsea, New York

CENTRIFUGAL PUMP

8" three stage all bronze Wilson-Snyder centrifugal pump rated

1800 GPM at 235 ft. head
1500 GPM at 275 ft. head
1200 GPM at 300 ft. head

Rebuilt and in first class condition, complete with base, coupling, and 200 HP. Westinghouse squirrel cage induction motor wound for 2200 volts, 3 phase, 60 cycle. Available for inspection and prompt shipment. Complete information on request.

The BROWN-FAYRO Co.
Johnstown, Penna.

FOR SALE

1—One **NORDBERG Hoist** No. 06392, 4 ft. drum, hydraulical brake direct connected 150 h.p., GE motor AC, 440 v. 3 ph. 60 cycle, speed 585, complete with panel board and ammeter.
2—Three **GE** 50 KVA Transformers.
3—One **POMONA Vertical Pump,** 75 h.p., AC, 250 v. 60 cy. 3 ph. Westinghouse motor, together with starting compensator, capacity 1000 gal. per min., 200 feet head.
4—One **ALLIS CHALMERS Pump,** type BS 13406, 100 h.p., motor AC, 220 v. 60 cy., 3 ph., capacity 1000 gal. per min., 250 feet head.
5—One **GE MOTOFLOW** model 5 KF 404 DWL **Pump** direct connected, 40 h.p. motor AC 440-220 v., 60 cy., 3 ph., 4" suction 2" discharge, capacity 300 gal. per min., 340 feet head.

All of the above equipment in first class operating condition

FS-607, Coal Age
520 No. Michigan Ave., Chicago, Ill.

FOR SALE
DUCK CONVEYOR BELT

600 feet—26" 4-ply 32 oz., ¼" top and bottom cover, 2500 to 3000 pound tensile strength of cover. One piece 500 feet and one piece 100 feet. New, never used. Price $2.50 per ft. cash, f.o.b. Scranton, Pa. Inquire

THE HUDSON COAL COMPANY
C. W. Carpenter, Purchasing Agent
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MINE LOCOMOTIVES
5 to 20 ton.

MINING MACHINES
Short and Arc Wall.

STRIPPING SHOVEL

M. G. SETS & ROTARY CONVERTERS

ROTARY DUMP
With weigh pan & scale.

PUMPS and FANS

COAL CRUSHERS

Will buy, sell or exchange. What do you need?

THE INDUSTRIAL EQUIPMENT CORP.
Warehouse: Carnegie, Pa.
P.O. Box 1647 Pittsburgh, Pa.

CONVERSION EQUIPMENT, Etc.

Just overhauled (in largest shop in Cincinnati vicinity)—Ready for immediate shipment:

1—100 KW., 250 volts DC, General Electric Synchronous Rotary Converter, Type TCC, 1200 rpm., compound wound, interpole; 3 phase, 60 cycle—AC end. Complete with Brush-raising Device; Field Break-up Switch; Speed-limit Device; Endplay Device; Field Rheostat, Etc.

Switchboards & Transformer also in stock.

Also in Stock:

1—200 KW General Electric Syn. Rotary Converter, Type HCC, 1200 rpm., 630 volts DC, compound wound, interpole; 6 phase, 60 cycle—AC end.
1—Westinghouse Motor-operated Brush Raising Mechanism.
3—165 KVA General Electric Rotary Transformers, 6600/445 volts, 1 phase, 60 cycle, Type HJ, Form KDD. With Oil.
30—5-ampere Type CO Westinghouse Inverse Time Overload Relays.
1—Air Drying Oven—11½ ft. long x 5½ x 5½ ft., with strip-heater units, new recording thermometer and panel.

R. H. Benney Equipment Co.
5024 Montgomery Rd., Norwood, O.

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36" gauge 15' wheel roller bearing 6½ and 7 ft. long inside, 4 ft. wide inside, 1½ ton capacity.

OAKWOOD COAL CO.
OAKWOOD, ILLINOIS

FOR SALE

Coal Screening System, including Crusher, for Screening various sizes of coal.

HAWS REFRACTORIES COMPANY
P.O. Box 350 Johnstown, Penna.

FOR SALE

MACHINERY, EQUIPMENT AND PORTABLE STRUCTURES

of

Pittsburgh Terminal Coal Corporation

Pittsburgh, Pa.

3—Allis-Chalmers 50 KVA, single phase, 60 cycle — 22000-2200 volts Transformers, serial #1375X1-1, 1375X1-2, 1375X1-3
1—Westinghouse 100 HP, 3 phase, 60 cycle, 2200 volts, 690 RPM motor serial #2326619
1—Rotor for 290 HP, 3 phase, 60 cycle, 2200 volts, 720 RPM Synchronous Motor
1—Armature for 200 KW, 250 volt, 720 RPM, D.C. Generator
1—Jeffrey 35 BB Mining Machine—partially dismantled
1—Tipple—structural part only
1—Marcus Screen—10′ 10″ wide with No. 5 Roberts & Schaefer Driving Head, screens and picking table
1—General Electric Motor, 50 HP. MY 342, Model 900, Form B 220 volts, 60 cycle, 3 phase, sec. volts 175-125 amps 860 RPM, Model 9385, serial #4817442
2—Loading Booms—Pan Type 4′ and 6′ wide
2—Westinghouse Motors, 10 HP, 220 volt 27 amps, 60 cycle, 3 phase, 870 RPM, frame 460 C, #3303385 E
1—Zobell Boom Hoist—Motor 5 HP, 220 volt, 60 cycle, 3 phase, 1600 RPM, Ind. Enclosed Motor, serial #6531
1—Zobell Boom Hoist—Motor 3 HP, 220 volt, 60 cycle, 3 phase, 1600 RPM, Ind. Enclosed Motor, serial #6487
1—Bucket Elevator, 120′ long, 8″ x 14″ Buckets
1—Belt Conveyor, 135′ long, 18″ wide
1—General Electric Motor, 7½ HP, motor #67A293, type FT944-4-7/5 Form CL, 3 phase, 60 cycle, 220 volts, 19.2 amps., 1740 RPM
1—Belt Conveyor, 125′ long, 32″ wide
1—Chain Flight Conveyor
1—Set Heyl & Patterson Jouncer Screens
1—Fairbanks 10 ton dial scale with drop bottom weight hoppe
3—Westinghouse 37½ KVA Transformers, volts 2200/220
1—Jeffrey MH 110 Motor
4500 Feet—500,000 CM Cable
1—Jeffrey MH 110 Locomotive—13 Ton
1—Jeffrey 35 BB Mining Machine
4—50 Ton Steel Bins in line with re-screen chutes
1—36″ Pan Type Conveyor—110′ long
1—General Electric Motor, 10 HP, 5 KC-365-A3, Frame 365, Type KG, 220-440 volts, 31/15.3 amps, 3 phase, 60 cycle 879 RPM, #5268692
1—Chain Flight Conveyor, 200′ x 30″—99 Flights, 12″ high
1—General Electric Motor, 20 HP, 5KG405 AD #1, type KG, frame 405, 220-440 volts, 56/28 amps. 60 cycle, 3 phase, 855 RPM. #5288205
1—Rescreen Belt Conveyor, 140′ long, 10″ wide
1—General Electric Motor, 3 HP, 5 KG254A2, frame 254, type KG, 220-440 volts, 9.3/4/65 amps, 3 phase, 60 cycle, 1140 RPM
1—Elevator Chain Conveyor, 74′ long, 50—10″ x 6″ Buckets
1—General Electric Motor, 5 HP, type 180-605-1200, 3 phase, 60 cycle, 6.7 amps, 1200 RPM, 220 volts, #792019
1—Dayton Doud Pump, Class 8 H2, L. H. Pump #1080, R. H. Pump, #1081, 5000 gal. cap.
1—General Electric Induction Motor, 2200 volts 300 HP, #4947898
1—Scranton Pump #12444, capacity 2,000 gallons
1—General Electric Induction Motor, type IE-13 229 volts, 125 HP #1775412
1—Scranton Pump #12443, capacity 2,000 gallons
1—General Electric Induction Motor, type L-E-13, 220 volts, 125 HP. #1775412
1—Scranton Pump #130034, capacity 2000 gallons
1—General Electric Induction Motor, type I-R-13, 220 volts, 125 HP. #3882780
1—Shepard Crane Hoist with
1—General Electric Induction Motor, form FX, class A, 5 HP.
16,500 Feet—1/0 wire—5280#, 5,840 Feet —500,000 CM Cable—9032#; 18,979 Feet —4/0 Round Wire—12165#; 1,000 Feet—2/0 Insulated Wire—403#; 1,605 Feet—2/0 bare wire—647#; 20,000 Feet—#6 Weatherproof Wire—1580#
1—Stator for 290 HP Synchronous Motor, 2200 volts, 3 phase, 60 cycle, 720 RPM, serial #6069978
1—Steel Trestle with timber bins with 6 shutes and 2 vibrating screens
2—Sets General Electric Lightning Arrestors (6 Units)
3—General Electric Transformers, 60 cycle, 100 KVA, 2200 to 220 volts, oil 60 gallons Nos. 1980173, 1976367, 1979613
1—Allis-Chalmers Parsons Turbine #750—3200 KW—P.F. 80% 3600 RPM—connected to Allis-Chalmers Alternator #108218 — volts 2300 — Amps. 1005 — 3 phase, 60 cycle, 3600 RPM with Westinghouse LeBlanc Condenser Size 17—serial #1183
1—Westinghouse Induction Motor — Type C.S. 150 HP 2200 volts, 60 cycle, 3 phase, 700 RPM, #1263797
1—Westinghouse Auto Starter, Type A, Frame #12, 3 phase, 60 cycle, 2200 volts, 150 HP.
1—Westinghouse Parsons Steam Turbine #2351, 3600 RPM
1—Westinghouse A.C. Turbo Generator, 1500 KVA, 2400 volts, 361 amps per terminal, 3 phase, 60 cycle, 3600 RPM, #1049359
1—Westinghouse D.C. Generator, 25 KW, 215 volts, 200 amps. 3600 RPM, #969502
1—Westinghouse Turbine #2362, E. O. 16997, 3600 RPM
1—Allis-Chalmers D.C. Generator Cont. Duty, 35 KW, 1750 RPM volts no load 125, amps 380
1—Terry Steam Turbine #3467—1800 RPM
1—Allis-Chalmers Induction motor, 50 HP 1750 RPM, 2200 volts 3 phase, 60 cycle, #847 K-33 HS-1-1
1—Westinghouse Auto Starter, Type A, Frame 10-30-P, 2300 volts 50 HP Style #402728
2—Alberger Pump & Cond. Co. 10″ Volute Pumps—Capacity 2150 GPM, 60′ Head, Speed 1160 RPM, #9864
2—Allis-Chalmers Induction Motors, Cont. Duty 40 H.P. 1160 RPM 2200 Volts, 3 phase, 60 cycle, 10 amps. Serial #377. K-26-C-1-1, #377 K. 26-c-1-2
2—Allis Chalmers Potential Starters, 2200 volts, 3 phase, 60 cycle, Type N2, serial Nos. 2 NSD #2827 and 2 NSD 2828
4—Lillie Hoffman Cooling Towers
8—Fans for Cooling Towers
4—Westinghouse Induction Motors, 50 HP. Type CS. 2200 volts, 3 phase, 13.1 amps per terminal, 60 cycle, 700 RPM. Style #179258, serial Nos. 1319990, 1319991, 2279940 and 2279241 with compensators
2—Westinghouse Air Circuit Breakers, 3 phase, 300 amps., 650 volts
6—Stirling Water Tube Boilers, 600 HP. each with Harrington Stokers and wing blowers for forced draft, 2 blowers to each boiler, boilers equipped with Blaw-Knox Tracifiers
1—General Electric Curtis Steam Turbine #18364, KW 2500, 3600 RPM, Form B, 4 stage, 175# pressure, condensing, connected to GE Alternator #1353497, Type ATB-2-3125-3600, Form T, amps 784, 3600 RPM, PF 80%, 2500 KW, 2300 Volts with Westinghouse Leblanc Condenser, size 16, #638
1—Westinghouse Induction Motor, Type CS, 200 HP, 2200 volts, 3 phase, 60 cycles, 1600 RPM
1—Westinghouse Auto Starter, Type A, 3 phase, 150 HP
3—Westinghouse single phase transformers, 500 KVA, 60 cycle, 22000 to 2200 volts, serial Nos. 363660, 353660 and 363662
2—Dean Hill Centrifugal Boiler Feed Pumps, size 4 x 4, 400 GPM, 200′ head, 4 stage
2—Westinghouse Induction Motors, Constant Speed, 100 HP, 23 amps, per Terminal, 2200 volts, 3 phase, 60 cycle, 1750 RPM, full load
2—Westinghouse Auto Starters, Type A, Frame 11, 3 phase, 60 cycle, 2200 volts, 100 HP, style #402469-A
1—Westinghouse Motor, slip ring, #4316222, 40 HP, 220 volts, 60 cycle, 3 phase, type CW, 870 RPM, frame 6584
1—Westinghouse Motor, Type SK, 230 volts, frame 110—75 HP.
1—Westinghouse DC Motor, 50 HP, type 3 K1201—#143902A
1—Westinghouse Motor, D.C. Type SK, 230 volts, 40 HP
1—General Electric Motor Generator set, Synchronous motor, P.F.1, type ATI Class 10-230-72, form C, 290 HP, speed 720, 2300 volts, 60 cycle, 60 amps. serial #995436. Continuous current generator, type DMC Class 6-200-720, form L, 727 Amps, speed 720 volts no load 250, full load 275, serial No. 447112
1—General Electric starting compensator 2200 volts, sec. 770-1100 type NR 2752, form A 3, all with G.E. Relay Panels Type P, form C-2, 60 cycle, 2500 volts. 375 Feet, 750,000 CM Cable; 3100 Feet, 500,000 CM Cable; 6400 Feet, 4/0 Trolley Wire
3—Packard Transformers, 250 KVA Polarity subtractive single phase, 60 cycle, 22000 to 2300 volts, serial #68604, #68605 and #68606
1—Fabricated Sheet Iron Sub-station building, housing motor generator sets, 25′ wide, 60′ long, 10′ high. Sides made of 6—10′ sections, each with window. 7 roof trusses and 14′ hinge door made in halves at each end
1—Tipple—structural part only
5—Steel bins of 17 sections
17—Armatures
1—Ridgeway Motor Generator Set. Synchronous Motor Generator #545, 300 HP, 6 amps per line, 900 RPM, 3 phase, 60 cycle, 2200 volts type ATB 8-300-900, Des. #28004 — Directly connected to Ridgeway Dynamo, #2211, Des. #22C-10 capacity 200 KW, 364 amps., 550 volt, 900 RPM—Exciter Generator—Ridgeway #2212, 3 KW, 24 amps, 125 volts, 900 RPM
1—Ridgeway Motor Generator Set. Ridgeway Synchronous Motor, #1208, Des. #28007, 300 HP, 3 phase, 60 cycle, 2200 volt, 900 RPM, 1.00% P.F. 18 amps. directly connected to Ridgeway Dynamo, #3508, Des. #22C-10, 220 KW 364 amps, 550 volts, 900 RPM, Exciter Generator—Ridgeway #3509, Des. 9C-20, 3 KW, 24 amps., 125 volt, 900 RPM
1—7′ x 14′ Capell Fan
1—General Electric Induction Motor, #423527, type 1-12-200 amps, 600 volts, form M, 60 cycle, 200 HP, amps 50, sec. amps. 198, volt 2200, speed 600, full load 585
3—Transformers — Pittsburgh Transformer Co 200 KVA, 60 cycle, single phase, 2500 volts primary, 460 volts secondary, form O.N 26093, serial #687979, 687980, 687978, taps ⅝ 2.5-5-7.5-10, 305 gal. capacity
1—Slate Hoist. 2 tandem Drums, 23½ Diam. 24″ face, shaft 4″ Diam. 143 tooth gear 6″ face, 48¾ Diam. pinion 23 tooth—8⅜″ Diam. 3½ both with Westinghouse motor, 70 HP, type K, frame 10, 550 volt DC, 117 amps, 465 RPM, serial #4185898, with controller #298725
1—Vulcan Hoist, serial #191, 400 HP, with 1¼″ ropes with motor control and panel less motor
2—Locomotives, Westinghouse, 12 Ton, 44″ gauge, 500 voltage, 907 C motor type, 41103 Serial No.; Jeffrey, 10 Ton, 44″ gauge, 500 voltage, MH 78 motor type, 1738 Serial No.
1—Westinghouse D.C. Motor, type SK, frame 140, 1700 RPM, 75 HP, style #154516 A, serial #4266951
1—Locomotive Motor—General Electric 10 Ton #HM-809
1—Rock Duster, Mine Safety Appliance Co. #361-A
1—Jeffrey Locomotive—Armor Plate—MH 110, 13 Ton

WILLIAM G. HEINER, Trustee

1321 Park Bldg., Pittsburgh, Pa.

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MORROW

MANUFACTURING CO. WELLSTON, OHIO

DESIGNERS AND BUILDERS OF COAL HANDLING EQUIPMENT FOR OVER 25 YEARS

Shaking Screens

Coal Washers

Car Hauls, Picking Tables

Loading Booms, Loading Chutes

Bins, Bin Gates

COMPLETE COAL TIPPLES AND COAL HANDLING EQUIPMENT

Elevating and Conveying Machinery

Sand and Gravel Screening and Washing Machinery

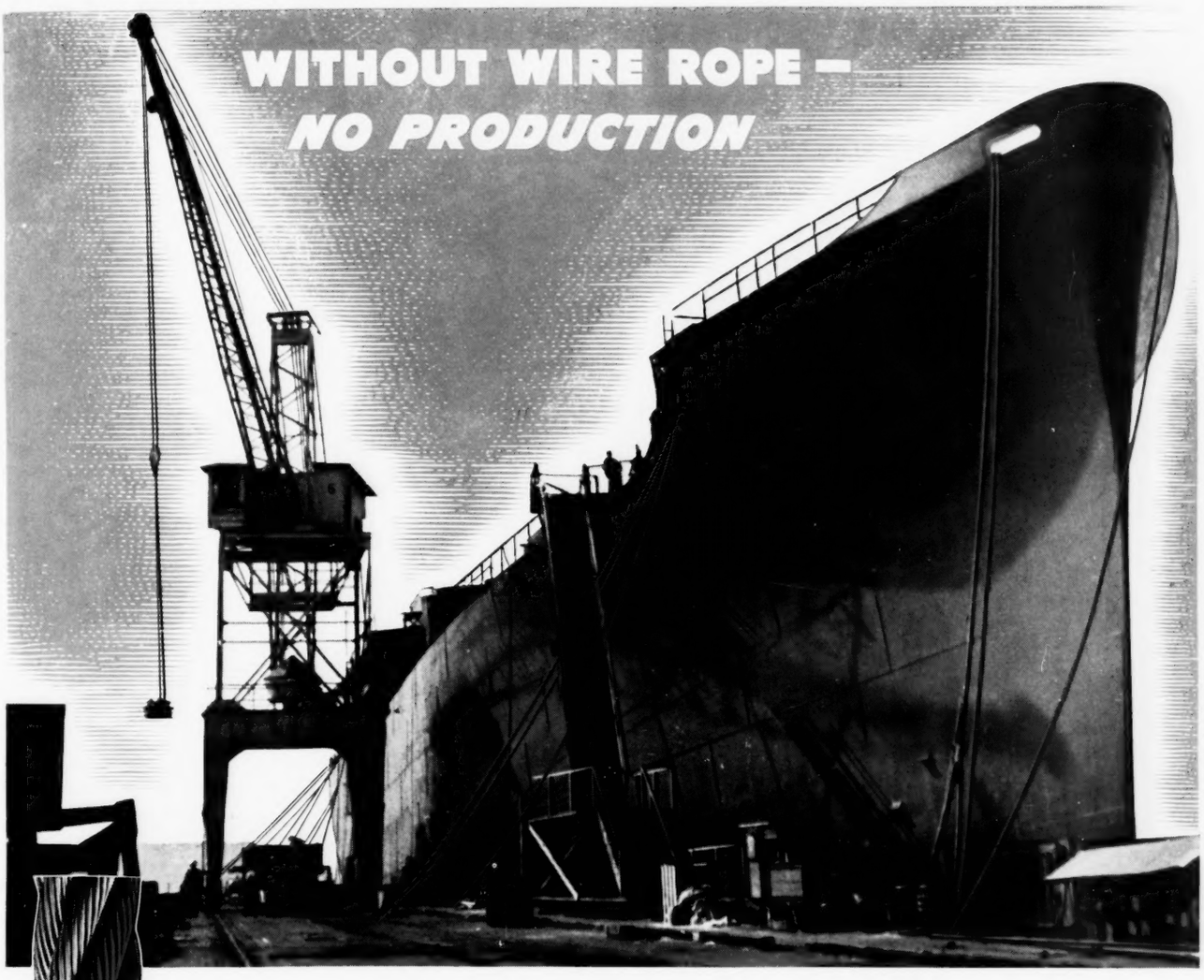
Car Retarders

Settling Tank, Grizzlies

Revolving Screens

Perforated Metal Screens

Flanged Lip Screen Plates



WITH TRU-LAY *Preformed* WIRE ROPE—

MORE PRODUCTION

Your machines will operate with fewer interruptions for wire rope replacement if they are equipped with American Cable TRU-LAY PREFORMED. That means steadier production; time and money saved; steel conserved. . . . Regardless of application, American Cable TRU-LAY PREFORMED WIRE ROPE invariably lasts longer than ordinary non-preformed rope. It gives you greater dollar value in increased service alone. But TRU-LAY does much more than this. It handles much easier, faster, *safer*. It is a flexible, tractable, willing-to-work rope—not the kinky, unruly kind that fights the men who are working with it. It spools on the drum better; runs true and straight over sheaves; requires no seizing when cut. . . . Aid production—conserve steel—save money by using American Cable TRU-LAY PREFORMED WIRE ROPE.

AMERICAN CABLE DIVISION

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco

AMERICAN CHAIN & CABLE COMPANY, Inc.

BRIDGEPORT • CONNECTICUT

ESSENTIAL PRODUCTS . . . AMERICAN CABLE Wire Rope, TRU-STOP Emergency Brakes, TRU-LAY Control Cables, AMERICAN Chain, WEED Tire Chains, ACCO Malleable Iron Castings, CAMPBELL Cutting Machines, FORD Hoists and Trolleys, HAZARD Wire Rope, Yacht Rigging, Aircraft Control Cables, MANLEY Auto Service Equipment, OWEN Springs, PAGE Fence, Shaped Wire, Welding Wire, READING-PRATT & CADY Valves, READING Electric Steel Castings, WRIGHT Hoists, Cranes, Presses . . . *In Business for Your Safety*

MORE PREMIUM SIZES

LESS DEGRADATION
LESS OVERSIZE
WITH THE

LINK-BELT 2-ROLL COAL SIZER

On Anthracite

Hudson Coal Company, who recently installed the 30″ x 36″ Link-Belt 2-Roll Sizer illustrated above, reports as follows regarding its performance: "Variations in market requirements require frequent changes in the size of our crushed product. The mechanism for quick adjustment allows us to make these changes without appreciable delay. Your sizer is a very practical machine for our purpose in sizing material which we receive in our crushing plant."

Size tests recently made show the following results. This is from a feed of stove and nut, 2 7/16″ x 15/16″:

Size	Test No. 1 Roll Setting 30 1/8″	Test No. 2 Roll Setting 30 3/4″
Chestnut +1″	7.5%	18.0%
Chestnut +15/16″		37.0%
Pea +9/16″	34.0%	26.0%
Buck +5/16″	32.5%	11.0%
Rice +3/16″	12.0%	4.5%
Barley +3/32″	8.0%	2.5%
Silt +1/16″	3.0%	0.5%
Silt —1/16″	3.0%	0.5%
Total Pea and Larger Sizes	41.5%	81.0%
Total Steam Sizes	58.5%	19.0%

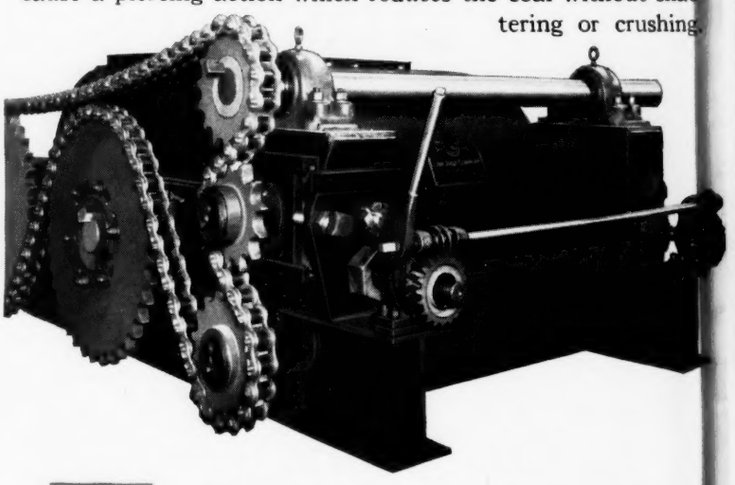
On Bituminous

A performance test, as shown in the table below, with two different roll settings, varying only by 3/16″, illustrates conclusively the extreme accuracy of size-control obtainable with this machine. Here the job was to produce a minus 1″ square mesh product from a 2″ x 1″ feed.

	With 29 3/4″ Roll Settings	With 29 15/16″ Roll Settings
Plus 1″ sq. mesh (Oversize)	0.02%	14.65%
1″ x 3/4″ thru sq. mesh	21.93%	45.40%
3/4″ x 1/2″ thru sq. mesh	36.24%	20.84%
1/2″ x 1/4″ thru sq. mesh	22.22%	10.30%
1/4″ x 1/8″ thru sq. mesh	8.70%	4.20%
1/8″ x 0″ thru sq. mesh	10.89%	4.61%

Look at this result: Where the desired products were 1″ x 3/16″ and 3/16″ x 0″ from a feed of 3″ x 1″ coal, another performance test showed—77.3% of 1″ x 3/16″—17.0% of 3/16″ x 0″—the balance, only 5.7% oversize. These are but a few examples of results being obtained from Link-Belt Sizers in many coal fields throughout the country.

● You can reduce costs when producing stoker-sizes from larger-sizes and at the same time decrease oversize and undersize by the installation of the popular Link-Belt Sizer. Its many exclusive and practical features, developed from years of research and experience, have proved advantageous to operators in many coal fields. Scientifically-spaced, accurately-meshed pyramidal teeth, combined with a low roll speed, cause a piercing action which reduces the coal without shattering or crushing.



New Mechanical Roll Adjuster

—Gives Greater Flexibility
—Saves Time—Increases Output

Where frequent adjustments of roll settings are required, considerable saving can be made with the Link-Belt mechanical roll adjuster which is available in two types—power and hand operated. (Hand operated type illustrated.) Let us tell you more about this feature of the Link-Belt 2-Roll Sizer

LET'S GO! U.S.A. KEEP 'EM FLYING!

LINK-BELT COMPANY, Chicago, Philadelphia, Pittsburgh, Wilkes-Barre, Huntington, W. Va.,
Denver, Kansas City, Mo., Indianapolis, Cleveland, Detroit, St. Louis, Seattle, Toronto, Vancouver